PAPER TRADE JOURNAL

Title Reg. U. S. Pat. Off.

Vol. 109, No. 16 Thursday, October 19, 1939 Price Ten Cents

Bids Asked On 46,677,000 Pounds of Paper

Joint Congressional Committee On Printing Will Open Proposals On November 27 For Six Months' Supply For the Government Printing Office Beginning January 1—Awards To Be Announced One Week Later.

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., October 18, 1939—Bids will be received on November 27, by the Joint Congressional Committee on Printing for a six months supply of paper for the use of the Government Printing Office beginning January 1, next. The committee will meet one week later to decide on awards.

The Congressional Committee is asking for bids on 46,677,000 pounds of various kinds of paper compared with 42,707,000 pounds purchased for the present six months period from July 1.

Report on Specification Changes

Ansel Wold, chairman of the Paper Specifications Committee of the Congressional Committee last week made the following report on specification changes;

The Committee on Paper Specifications respectfully submits its Thirty-eighth Report and the accompanying recommended schedule for paper for the public printing and binding and blank paper for the use of the Government departments and establishments in the District of Columbia for the term of 6 months, beginning January 1, 1940.

Paragraph 4 of the Instructions under the heading "Lots Separately Considered," has been revised to inform prospective bidders that "bids based on combination of lots may be rejected."

Paragraph 65 of the Instructions under the heading "Packaging."—The over-all dimensions of loaded skids were increased to not exceed 43 inches in width and 65 inches in length from 42 inches in width and 64 inches in length. This change was found necessary in order to protect the edges of our large size paper.

Paragraph 91 (b) of the Instructions under the heading "Walsh-Healey Act" was revised to advise prospective bidders that "The Secretary of Labor" made determination of minimum wages in the pulp and paper industry, September 26, 1939, effective on specifications issued on or after October 15, 1939.

LOTS 36 AND 37—*Coated book and 50 per cent rag coated book.*—The finish (smoothness) was reduced from 1,000 seconds to 800 seconds in order to conform more closely to good commercial practice.

LOTS 66 AND 67—*75 per cent rag map paper.*—This paper is to be delivered in wooden cases with ream markers omitted instead of on skids.

LOT 69—*100 per cent rag chart paper.*—Provisions were made for 83-pound paper to meet the demands of the executive departments.

LOT 205—*50 per cent rag laid cover.*—This paper is to be delivered in wrapped bundles instead of on skids.

LOT 368—*Binders board, best quality.*—The binders boards on this lot may be purchased in minimum quantities of 5,000 pounds.

This schedule embraces 169 lots, which is the same as the preceding schedule. The quantity estimated for the term of 6 months beginning January 1, 1940, is approximately 46,677,000 pounds, as compared with 42,707,000 pounds for the previous contract period of 6 months.

Quantities Asked For

The bids are asked for the following quantities;

1,500,000	pounds newsprint paper.
4,611,000	pounds machine-finish book paper.
500,000	pounds antique book paper.
500,000	pounds off-set book paper.
80,000	pounds lightweight machine-finish book paper.
300,000	pounds 50% rag antique book paper.
10,000	pounds 75% rag laid antique book paper.
20,000	pounds 100% rag antique book paper.
2,280,000	pounds supercalendered book paper.
720,000	pounds coated book paper.
30,000	pounds lithograph paper.
4,000,000	pounds mimeograph paper.
400,000	pounds U S M O safety writing paper.
8,000	pounds U S M O writing paper.
4,000	pounds safety writing paper.
9,402,500	pounds writing paper.
510,000	pounds map paper.
1,335,000	pounds manifold paper.
6,912,000	pounds bond paper.
1,030,000	pounds ledger paper.
1,235,000	pounds index paper.
3,500	pounds tissue paper.
300,000	pounds cover paper.
600,000	pounds manila paper.

(Continued on page 19)

Thilmany To Expand Its Converting Plant

Announcement Made of Acquisition of Building By Thilmany Pulp & Paper Co. For Expansion of Its Converting Plant—Masonite Corp. Issues Good Report — S. & S. Produces 3 Million Caps Daily — Other News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., October 16, 1939—Expansion of its converting plant is planned by the Thilmany Pulp and Paper Company, Kaukauna, Wis. For this purpose, the company last week announced it has leased a building of the former Union Bag and Paper Company near its plant. The property is now owned by the Green Bay and Mississippi Canal Company, which has engaged C. R. Meyer & Sons Company, Oshkosh, Wis., to rehabilitate and reconstruct the interior for this purpose. A number of adjacent wooden structures will be torn down. Converting equipment for its wrapping and other specialties will be installed in the near future, and a portion of the building will be used as a warehouse. The Union Bag company abandoned the mill several years ago.

S. & S. Produces 3 Million Milk Caps Daily

Production at the S. & S. Paper Products Company, Milwaukee, Wis., has increased 53 per cent since 1929. The company, headed by Frank Sztukowski, produces milk bottle caps exclusively and is now turning out 3,000,000 daily. About 400,000 are sold in Milwaukee and the remainder find outlets in 35 states.

The company was started in 1919 in a small plant at Pulaski, Wis., and turned out 25,000 caps per day on machines designed by Mr. Sztukowski's brother-in-law. A modern plant was built a year later in Milwaukee at 5051 Lake Shore Drive, and the business has been growing steadily ever since. The plant now has machines that do the die-cutting, printing, paraffining and stamping all in one operation. The fastest unit turns out 90,000 caps per hour.

Masonite Issues Good Report

Masonite Corporation will hold its annual meeting of stockholders at Wausau, Wis., October 27, according to a letter issued from the Chicago offices last week by Ben Alexander, president.

In summarizing the company's operations, Mr. Alexander said the products supplied to the building and construction outlets were now only a small part of its market. A majority of its products now go to the industrial market.

In the automobile industry alone, said the report, the use of Masonite products has progressed to the point where they are found in all but two makes of cars. The boards are used as lining for automobile doors and a base for upholstery. Other industrial uses include: Headlining, panels and wainscoting for railroad cars, buses and trailers and ships; advertising signs and displays; toys and games; radio-cabinets; kitchen cabinets, sink tops, drain and work boards; restaurant, bar and beauty parlor equipment; backs for cases, clocks, mirrors and pictures.

Regular quarterly dividends of $1.25 quarterly on five per cent preferred stock, and $1.00 per share (25 cents quarterly) on common stock have been paid. Although the firm's net profits for the year amounted to $1.99 per share on the common stock, no extra dividends have been paid because the directors "deemed it timely, due to unsettled world conditions, to maintain an unusually strong working capital position."

Mr. Alexander further stated that the corporation's long-term program of research in the field of chemicals and plastics was continuing, and that as a result the company during the last year placed a new type of pressed wood board on the market.

It was announced that the new plant of Masonite Company of Canada, Ltd., at Gatineau, Quebec, was expected to be operating early next year. The Canadian company is owned jointly by Masonite Corporation and the Canadian International Paper Company, Ltd.

Kimberly-Clark Plans for Safety Day

Committees of Kimberly-Clark Corporation's mill at Kimberly, Wis. are working out a program for the fourth annual mill and community safety day to be held November 2. The general committee in charge consists of J. T. Doerfler, mill manager, chairman; A. J. Courchane, secretary, and W. H. Webb, J. A. Limpert, E. H. Schiemann, O. H. Ehlke, H. G. Fird, O. K. Hannemann and H. J. Kokke. Programs will be held at the mill clubhouse in the morning and evening. Open house will be held at the mill from 10:30 in the morning until 4:30 in the afternoon to permit visitors to go through. Mr. and Mrs. J. F. Bannister, dramatists, of Appleton, Wis., have been engaged to direct the evening program.

Nekoosa-Edwards Aids Fire Fighters

Nekoosa-Edwards Paper Company, Nekoosa, Wis., took a hand last week in extinguishing a 30-acre peat fire near the mill. A four-inch water main was laid from the mill to the fire location to supply water for fire fighting crews. Forest rangers also assisted in keeping the fire from spreading.

Forest fires in Wisconsin during the last year have been held at a minimum, saving much of the losses formerly consuming valuable pulp wood stands. More than a thousand fires occurred but they were confined to 9,910 acres, and most of them were extinguished before they could spread. The estimated damage was $21,460, according to the United States Forest Service.

School Offers Paper Making Course

A general course in pulp and paper manufacture will be offered paper mill workers this fall at the Vocational school at Appleton, Wis. Enrollments are being received in the trades and industry division and the dates and exact subject material will be determined after registration is complete. Carl Bertram, coordinator, is in charge.

Canadian Fine Paper and Pulp Mills Busy

Heavy Demand For Various Grades of Fine and Wrapping Papers and Sulphite Pulp Provides Large Orders For Many Mills—Surplus Production of Sulphite Pulp Now Selling Above Contract Prices — Other News.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., October 16, 1939—During the past few weeks there has been an unusually heavy demand for the various grades of fine paper as well as for wrapping paper and sulphite pulp, and as a result the various mills specializing in these products are extremely busy. Surplus production of sulphite is now selling at well above contract prices, but so far there has been no general increase in paper products, although the mills are cautious about making deliveries very far ahead at present prices. It is reported that the largest unit in the fine paper industry, Howard Smith Paper Mills is now well ahead of last year as regards earnings, and that results for the full year appear likely to exceed those for 1937.

New Market for N. S. Pulpwood

From Halifax, N. S., it is reported that with the outbreak of the war, considerable pulpwood was left in the hands of the producers or piled on wharves, especially as regards shipments which were destined for Germany. Considerable quantities had been shipped to Germany last year and, had war not broken out, at least as large a quantity would have gone forward this year. As it was, shipments from the Maritimes to Germany continued up to a short time before the outbreak of hostilities and, when German vessels were peremptorily ordered to sail for home, large quantities of the wood were left at various Maritime points. In other words the German market, the main source of consumption abroad at that time, ceased to exist.

Insofar as the pulpwood producers of Richmond County are concerned, it is announced that the wood left on their hands will be disposed of by the provincial department of marketing and price, it is believed, will be better than they would have received from the German buyers who had contracted to take the entire lot. Just how the wood is to be disposed of has not as yet been stated.

R. H. Cumming, secretary-manager of the Maritime Lumber Bureau, has announced that an inventory is being made of all lumber in the Maritime Provinces available for marketing, and inventory forms have already gone to all Maritime lumbermen. He added that the survey is being made in connection with the winter production plans of the Bureau and the lumber operators. He indicated that plans were under way to develop an increased demand in Great Britain for pit props from the Maritimes.

Expansion of Wood Cutting Operations

Due to the present and prospective increase in the demand for newsprint and various forms of wood pulp, there is a general expansion in the plans of pulp and paper companies for wood cutting operations during the winter season. It is anticipated, for instance, that approximately 400,000 tons of newsprint that would otherwise have been imported from Scandinavian countries by the United States will have to be supplied by Canada. As an example of the increased activity in lumbering camps, it is reported that the wood cutting operations of Price Brothers and Company in Quebec will show an increase of 60 per cent over last year. At present about 3,000 men are employed in the Price Brothers' camps and the number will shortly be increased to 4,000.

September Newsprint Statistics

Production of newsprint in Canada during September 1939 amounted to 253,230 tons and shipments to 267,005 tons, according to the News Print Service Bureau. Production in the United States was 77,309 tons and shipments 78,559 tons, making a total United States and Canadian news print production of 330,539 tons and shipments of 345,564 tons. During September, 27,390 tons of news print were made in Newfoundland, so that the total North American production for the month amounted to 357,929 tons. Total production in September 1938 was 322,553 tons.

The Canadian mills produced 144,239 tons more in the first nine months of 1939 than in the first nine months of 1938, which was an increase of seven and five tenths per cent. The output in the United States was 111,146 tons or eighteen and seven tenths per cent more than in the first nine months of 1938, in Newfoundland 33,820 tons or eighteen per cent more, making a total increase of 289,205 tons, or ten and seven tenths per cent.

Stocks of news print paper at the end of September were 200,884 tons at Canadian mills and 16,696 tons at United States mills, making a combined total of 217,580 tons compared with 232,605 tons on August 31, 1939.

To Expand Fenimore Mill

[FROM OUR REGULAR CORRESPONDENT]

HUDSON FALLS, N. Y., October 16, 1939—Announcement is made here of plans under way for construction of a new addition to the Fenimore branch of the Union Bag and Paper Corporation which will cost in the neighborhood of $83,000. Ground was broken this week for the structure which will be 100 by 125 feet, two stories in height. The new addition will contain converting equipment for the processing of paper and will allow a doubling of the present production when it is completed. The excavation is under the supervision of the Kingsbury Construction Company and the rest of the work will also be awarded to contractors. It is expected that the work will be completed and the plant in operation within about three months. The Fenimore division is now operating near capacity and many additional hands will be employed with the new plant operating.

Midwest Reports More Orders for Newsprint

Chicago Market Continues To Show Business Gains With Prices of All Grades of Sulphite Papers Up $5 To $6 Per Ton—Paper Trade Cooperates In Community Drive—Milk Container War Continues—Other News.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., October 16, 1939—The Chicago paper market continues to quietly consolidate its gains and to proceed into stronger ground in a most orderly fashion. During the week all grades of sulphites were reported to have advanced from 5 to 6 dollars a ton. This was the only report quoted as to specific strengthening although virtually all grades were said to be in good demand. Some falling off has been noticed in the quantity of buying orders but this has been welcomed in many centers as an opportunity to catch up on things and to move to a more routine procedure. Krafts continued strong with the market well based. Newsprint was in improved demand as business conditions bettered generally while groundwoods were also moving to a stronger position. Books held recent gains and gave no indication of any receding while covers were in a similar spot. The waste paper market locally continued strong. There seemed to be plenty of indication that the "war news" has been only a part of the reason for the strengthened markets and that fundamental business improvement is likewise an important factor.

Paper Trade Cooperates in Community Drive

As is customary, leaders in the paper industry in Chicago will again play a leading part in soliciting $3,611,000 for the Community Fund of Chicago this year in order to help finance operations of 178 charitable institutions and agencies representing all creeds and non-sectarian groups. A. G. Ballenberg, treasurer of the Morris Paper Mills, will be industrial chairman of the Paper Division. He will have as chairman of his advisory committee, Leo S. Altholz, Inlander-Steindler Paper Company.

Vice chairmen of the various divisions of the paper industry follow: Tags, Cups and Bags, A. G. Shannon, International Tag and Salesbook Company; Burlap, H. S. Eckhaus, Central Bag and Burlap Company; Folding Boxes, M. G. Fessenden, Ace Carton Company, Set Up Boxes, R. W. Darnell, W. C. Ritchie & Company, Coarse Paper, E. J. Loewenthal, Schwarz Paper Company; Coarse Paper Brokers, W. W. Goldberg, Bateson & Company; Coarse Paper Manufacturers, G. K. Gibson, Mosinee Paper Mills; Envelopes, R. W. Randolph, Heco Envelope Company; Fine Paper Manufacturers, Logan W. Miller, Fraser Industries, Inc., Waste Paper, T. F. Woody, Pioneer Paper Stock Company; Fine Paper Dealers, G. E. Howell, Western Paper Merchants Association; Corrugated Papers, E. R. Schueler, Evans Fibre Box Division, Hinde-Dauch Paper Company. The Chest Drive will be concentrated into the next few weeks with paper executives firm in their belief that they can go "over the top" in reaching their quotas.

Chicago Waste Price Comparisons

Some indication of the extent of recent advance in waste paper is found in a comparative study of prices on August 12 as compared to October 11. Local news sources, including the Journal of Commerce, show mixed papers at .20 to .30 on October 11 as compared to .05 to .10 on August 12. Following are the present prices in other grades with the figures in parentheses indicating the August prices—quoted as Chicago dealers buying prices. No. 1 Mixed clean, .30 to .40 (.10 to .15); folded news, .55 to .60 (.15 to .20); box board, .30 to .40 (.10 to .15); No. 2 book .40 to .50 (.20 to .25; old containers) .35 to .45 (.20 to .25); No. 1 book .60 to .80 (.30 to .40); No. 1 white shavings, .90 to $1.15 (.90 to $1.15).

Milk Container War Continues

The city of Chicago this week began its innings with reference to the local ban on the use of paper milk bottles. Attorneys began offering testimony to show why Chicago has refused to permit the use of paper containers and represents another step in the suit brought by Fieldcrest Dairies. Paul Krueger, chief sanitary officer of the board of health, said a close watch on sanitary conditions at the dairies is kept through regular test of bottles. It was also disclosed at the hearing that the health board has been testing paper containers for several months. Attorneys for the dairy company retorted that the tests started after the Fieldcrest suit was filed and that nothing was done during the year while an application for a permit to use paper containers was awaiting action.

Warren Printing in 20-page Folder

"Words by Mr. Webster" is the title of the latest release of the S. D. Warren Company providing a most interesting study on the implications and inferences of words. Included is a most timely discussion of the value of increasing appreciation of current values and a final word about the usefulness of the Warren line. The latter part of the 20 page folder contains illustrations on Warren's lustro-Gloss folding enamel suitable for reproduction of good halftones, for metallic ink usage, for gloss ink printing and press varnishing and lacquering. Each of these uses is attractively illustrated in the folder which comes through the Chicago Paper Company, local distributor.

Zellerbach Describes Novel Selling Plan

The "Informant", house organ published by the Zellerbach Paper Company, continues to be practical in its application by discussion "Table Toppers" and unique and productive ways of utilizing table tops to sell merchandise. The house organ continues the glossary of paper trade terms, adds a discussion on "Rubber Plate" for the trade and winds up with a tribute to printing "The Mother of Progress" as written by W. D. Fuller, president of the Curtis Publishing Company.

Financial News of Pulp and Paper Industry

Vancouver Kraft Company, Ltd., Being Dissolved — Appraisal of Harry P. Gould Estate Filed—Marathon Bonds Called For Payment November 1 — Net Profit Reported By Masonite — Joseph B. Ely Named Trustee.

New York Stock Exchange

High, Low and Last for the Week Ending October 18, 1939

	High	Low	Last
A. P. W.	3⅛	2⅞	3⅛
Armstrong Cork Co.	37¾	35⅝	37
Celotex Corp.	10⅝	9⅞	10¼
Celotex Corp., pf.	59	59	59
Certain-Teed Products Corp.	7⅜	6⅞	7⅛
Certain-Teed Products Corp., pf.	31	29	30¼
Champion Paper & Fibre Co.	27¼	26½	27¼
Champion Paper & Fibre Co., pf.	100	100	100
Congoleum-Nairn Co.	23	22	22⅞
Container Corp. of America	16	14⅝	15⅞
Continental-Diamond Fibre Co.	8⅜	7¾	8¼
Crown-Zellerbach Co.	15⅞	14½	15¾
Crown-Zellerbach Co., pf.	87	86	86⅛
Flintkote Co.	19¾	17½	19¼
Robert Gair	5⅛	4⅜	5⅛
Robert Gair, pf.	16½	14⅞	16¼
International Paper & Power	14	12½	13¾
International Paper & Power, pf.	50⅜	46	49½
Johns-Manville Corp.	81¾	77½	80½
Johns-Manville Corp., pf.	126½	126½	126½
Kimberly Clark Corp.	37	35⅛	37
MacAndrews & Forbes	29½	29	29½
Masonite Corp.	38	36⅜	37¾
Mead Corp.	12¾	11½	12½
Mead Corp., pf.	70	70	70
Paraffine Companies, Inc.	40½	40	40½
Paraffine Companies, Inc., pf.	94½	94½	94½
Ruberoid Co.	20	17¼	19½
Scott Paper Co.	49⅝	47¼	49⅝
Scott Paper Co., pf.	113	112½	112½
Sutherland Paper Co.	26¾	24½	26¾
Union Bag & Paper Corp.	12⅜	11½	12
United Paperboard Co.	6⅞	6	6⅝
U. S. Gypsum Co.	79⅝	72½	78½
U. S. Gypsum Co., pf.	159	158	159

New York Curb Exchange

High, Low and Last for the Week Ending October 18, 1939

	High	Low	Last
American Box Board Co.	8	8	8
Brown Co., pf.	24½	22½	24½
Great Northern Paper	42	42	42
St. Regis Paper Co.	3⅝	3¼	3⅜
St. Regis Paper Co., pf.	58¾	58¾	58¾
Taggart Corp.	4½	4	4¼

Vancouver Kraft Being Dissolved

The Vancouver Kraft Company, Ltd., is being dissolved and a new corporation formed. This fact came to light recently when holders of obligations of California-Oregon Paper Mills and its successor, Columbia River Paper Mills, received notification from F. W. Leadbetter, president of Columbia River Paper Mills, that the reorganization plan of Vancouver Kraft Company, under which the obligations were issued, has been completed.

Under the plan, the notice said, Vancouver Kraft Company, Ltd., is being dissolved. Its stock, it was said, is shown to have no value, equity in the company now being represented by obligations of California-Oregon Paper Mills and Columbia River Paper Mills, successor.

Holders of these obligations are urged in the letter from Mr. Leadbetter to forward their securities to Title & Trust company, in order that securities of Vancouver Kraft Corporation, Ltd., a new company, may be forwarded from registered offices in British Columbia.

Estate of Late Harry P. Gould

[FROM OUR REGULAR CORRESPONDENT]

LYONS FALLS, N. Y., October 16, 1939—An appraisal of the estate of the late Harry P. Gould, former head of the Gould Paper Company, filed this week, shows that he left a gross estate of $2,842,836.58. Deductions of $229,426.93 from the gross leave a net estate of $2,613,409.65 which is divided among his widow and two sons, according to his will. Outside of the $1,110,987.40 of stock of the Gould Paper Company, jointly held by them, the legacy value of the three in the remainder of the estate is appraised at $506,137.41 to the widow and $498,142.42 to each son. The gross estate consists of $36,306.70 of real estate; $1,100,242.92 bonds; $1,538,468.97 stocks; $136,190.71 cash; $2,287.38 mortgages; $27,244.90 notes; $2,095 miscellaneous property. Life insurance less than $40,000 is paid to beneficiaries. According to the schedules, the deductions amounting to $229,426.93 consist of $203,120.04 for the funeral and cost of administration of the estate, plus an indebtedness of $26,306.89. Executors under the will are Mrs. May R. Gould and Gordon H. P. Gould and Henry R. Gould, sons.

Marathon Calls Bonds

APPLETON, Wis., October 16, 1939—All outstanding first mortgage bonds of the Marathon Paper Mills Company, Rothschild, Wis., in the principal amount of $1,750,000, have been called for payment November 1. Premiums ranging from ½% to 1½% will be paid according to the dates of maturity except on the bonds falling due November 1, 1939. The First Wisconsin Trust Company of Milwaukee, Wis., is handling the transaction. The company has arranged a new program of financing at lower interest rates, according to announcement previously made, including both the retirement of the present bonds and additional capital for expansion of operations.

Masonite Nets $1,163,050

The Masonite Corporation reported for the year to August 31 a net profit of $1,163,050, equal after 5 per cent preferred dividends, to $1.99 each on 539,210 shares of no par common stock outstanding. This compared with $1,144,274 or $1.95 a share on 538,842 shares in the previous year. Net sales totaled $7,233,390 for the year ended August 31, 1939. Current assets as of August 31, 1939, including $1,220,816 cash, amounted to $3,560,125 and current liabilities were $925,220 compared with cash of $718,323, current assets of $3,005,878 and current liabilities of $782,147 on August 31, 1938. Inventories were $1,016,819 against $1,288,238.

Joseph B. Ely Named Trustee

HAVERHILL, Mass., October 14, 1939—Former Governor Joseph B. Ely last week was named a trustee to assist in the liquidation of the International Paper and Power Company succeeding Redfield Proctor, former Governor of Vermont, who resigned because of ill health.

Government Paper Bids and Awards

Government Paper Bids and Awards

WASHINGTON, D. C., October 18, 1939—Barton, Duer & Koch Paper Company has been awarded the contract for furnishing the Government Printing Office with 100,000 sheets of 22 x 35 white railroad board at $25.76 per M sheets, bids for which were received on September 27.

Mudge Paper Company will furnish 7,268 pounds (46,000 sheets) of 34 x 55, 158, M. F. book paper at 5.29 cents. Stanford Paper Company will furnish 1,660 pounds (37,725 sheets) of 28 x 34 yellow sulphite paper at 12 cents. Barton, Duer & Koch Paper Company will furnish 20,100 pounds (200,000 sheets) of 21 x 32, 50 per cent rag, white ledger paper at 9.75 cents. Bids for all of these items were received on September 25.

Paper Corporation of U. S. will furnish 44,400 pounds (150,000 sheets) of 24 x 38 H. F. sulphite manila tag board at 5.24 cents and Marquette Paper Company will furnish 18,700 pounds (200,000 sheets) of 32 x 42 yellow sulphite writing paper at 6.25 cents. Bids for these items were received on September 22.

National Pulp and Paper Company will furnish 200,000 pounds of newsprint paper in 48 inch rolls at 2.5 cents and Paper Corporation of U. S. will furnish 100,000 pounds same at 3 cents, bids for which were received on September 20.

National Pulp and Paper Company will furnish 40,000 pounds of newsprint paper in 24 inch rolls at 2.5 cents and the same firm will furnish 150,000 pounds same in 48 inch rolls at the same price. Link Paper Company will furnish 5,000 pounds of oiled manila tympan paper in 38 inch rolls at 7.5 cents. Bids for these items were received on September 18.

R. P. Andrews Paper Company will furnish 106,200 pounds (1,180,000 sheets) of 27½ x 39 M. F. book paper at 4.37 cents, bids for which were received on September 15.

The Printing Office has received the following bids for 2,000 sheets of 24 x 36 Quaker drab cloth lined cover paper; Barton, Duer & Koch Paper Company, $149.90 per M sheets; Mudge Paper Company, $148.28; Whitaker Paper Company, $148.45; Virginia Paper Company, $153.50; Thomas Barrett & Sons, $162.50; Graham Paper Company, $150.00; and Old Dominion Paper Company, $154.43.

For 100,000 sheets of 22 x 34 white gummed paper; Whitaker Paper Company, $10.26 per M sheets; R. P. Andrews Paper Company, $10.39; Andrews Paper House of York, $10.25; Cauthorne Paper Company, Inc., $10.24; Mathers-Lamm Paper Company, $11.65; Old Dominion Paper Company, $9.644; and Virginia Paper Company, $10.50.

For 21,000 pounds (750,000 sheets) of 50 per cent rag, 10½ x 16 white lithographed paper; Aetna Paper Company, 10.71 cents; Whitaker Paper Company, 10.38 cents; R. P. Andrews Paper Company, 11.17 cents; Mudge Paper Company, 10.435 cents; Mathers-Lamm Paper Company, 14.79 cents; Stanford Paper Company, 10.32 cents; and Paper Corp. of U. S., 10.64 cents.

For 102,350 pounds (800,000 sheets) of No. 40 white sulphite bond paper; Stanford Paper Company, 6.25 cents; R. P. Andrews Paper Company, 5.72 cents; Marquette Paper Company, 5.67 cents; Aetna Paper Company, 6.06 cents; Old Dominion Paper Company, 5.98 cents; Enterprise Paper Company, 6.03 cents; Walker, Goulard Plehn Company, 6 cents less 2 per cent; and Barton, Duer & Koch Paper Company, 6.06 cents.

For 5,000 pounds (96,000 sheets) of 22 x 34 blue sulphite writing paper; Stanford Paper Company, 9 cents; Aetna Paper Company, 8.25 cents; and Marquette Paper Company, 6.98 cents.

For 21,375 pounds (150,000 sheets) of 50 per cent rag, 28 x 34 white ledger paper; Butler Company, 14.55 cents; Mudge Paper Company, 10.92 cents; Whitaker Paper Company, 10.94 cents; Stanford Paper Company, 10.85 cents; Barton, Duer & Koch Paper Company, 10.65 cents; R. P. Andrews Paper Company, 12.61 cents; Aetna Paper Company, 14.12 cents; Baxter Paper Company, 12.75 cents; Paper Corporation of the U. S., 12.07 cents; Marquette Paper Company, 12.74 cents; Mathers-Lamm Paper Company, 11.64 cents; and Virginia Paper Company, 11 cents.

Byron Weston Co. Elects Officers

At a recent meeting of the stockholders and directors of Byron Weston Company, Brenton C. Pomeroy was elected president, succeeding the late Donald M. Weston, and John H. Bellows was elected treasurer and clerk of the Corporation.

Mr. Pomeroy attended the public schools of Pittsfield, Mass., and was graduated from Phillips Andover Academy with the class of 1913, starting in the paper business in the fall of the same year.

He was a member of the New York National Guard, Squadron A, and later resigned to take a commission during the World War with the 13th U. S. Cavalry. Following his discharge in 1919 he joined the sales force of Byron Weston Company, serving in various capacities, including that of sales manager during the presidency of the late Philip Weston. On the death of Philip Weston in 1934 and under the succeeding presidency of Donald M. Weston, Mr. Pomeroy became vice president and treasurer of the company.

Mr. Bellows has been with the Byron Weston Company for thirty-seven years, serving in various capacities including those of Office Manager and Assistant Treasurer. His long experience well fits him for his new duties as Treasurer.

In addition to these officers, Hale Holden, Jr., nephew of the late Mr. Weston, and vice president of the Pullman Company, was re-elected a director of the company.

Walter G. Hendrich is continuing to act as manager of production, G. L. Giddings as manager of sales, Robert Crane as eastern sales manager and Harry Birt as Western sales manager.

Byron Weston Company has for seventy-six years been engaged exclusively in the manufacture of high-grade rag content papers. Its present line consists of a complete range of quality rag content ledgers, bonds, index bristols and specialties, well-known to the trade, and produced in thoroughly modern and up-to-date mills.

Ohio TAPPI and Supers Honor Harvey

The Ohio Section of the Technical Association of the Pulp and Paper Industry and the Miami Valley Division of the Superintendents Association met at the Manchester Hotel, Middletown, Ohio, on Saturday evening, October 14th. About 250 attended to do honor to George Harvey, veteran paper maker and production manager of the Gardner-Richardson Company. K. P. Geohegan, of the Aetna Paper Company and Chairman of the TAPPI Section presided.

Brief addresses were made by O. P. Gephart, Chairman of the Superintendents Division and E. T. Gardner, President of Gardner-Richardson Company. Testimonial letters from Frederic C. Clark, President and R. G. Macdonald, Secretary-Treasurer of TAPPI, Charles R. Hook, President of The American Rolling Mill Company and Roy Tellers of the French Paper Company. The testimonial address was made by Homer H. Latimer of The Champion Paper and Fibre Company and on behalf of both groups presented a placque as a permanent record of their feeling for Mr. Harvey.

In responding, Mr. Harvey related many of his experiences as a young man in the paper industry and commented on the progress made in the manufacture of paper and the development of machinery.

Those present included:

Mr. and Mrs. R. O. Brosius, Mr. and Mrs. M. V. Brooks, Dr. D. S. Brown, Urbun Crout, Frances Carmody, Mr. and Mrs. Colin Gardner III, Mr. and Mrs. E. T. Gardner, Mr. and Mrs. Milton Johnston, Mr. and Mrs. John Ditmyer, Mr. and Mrs. Ted Sooy, Thage Dahlgren, Mr. and Mrs. A. R. Harvey, H. E. Hadley, John Hain, Mr. and Mrs. Reynold Howard, Mr. and Mrs. Richard Holmes, Mr. and Mrs. Wm. Newman, Mr. and Mrs. Roland Richardson, Mr. and Mrs. Paul Richardson, Mr. and Mrs. Wm. Rettig, Mr. and Mrs. W. E. Sooy, George W. Schaefer, A. Ashworth, Mr. and Mrs. George E. Harvey, Mr. and Mrs. George H. Harvey, Mr. and Mrs. J. Wells, Mr. and Mrs. Harry Fisher, Ed Geran, Earl Turvey, Miss Helen Haynes, Miss Helen Ditmyer, Wm. Macklen, N. R. Stillwell, Mr. and Mrs. T. H. Latimer, Mr. and Mrs. J. B. Clarke, W. H. Hall, T. Agronin, John Hamm, Jr., Walter Thomas, R. F. Steward

R. M. Bond, Mr. and Mrs. M. L. Barker, Mr. and Mrs. John Burnett, Mr. and Mrs. Buchanan, Mr. and Mrs. Val Fredriech, Mr. and Mrs. Harold Leighton, Mr. and Mrs. R. K. Stevenson, Mr. and Mrs. Wm. Reigers, Mr. and Mrs. Andrew Frazer, Mr. and Mrs. F. S. Crysler, John Cornell, P. S. Cade, Mr. and Mrs. O. P. Gephart, Mr. and Mrs. R. L. Eminger, Mr. and Mrs. Ed. Fitzgerald, Mr. and Mrs. R. J. Gillespie, Mr. and Mrs. K. P. Geohegan, Mr. and Mrs. W. W. Galloway, Mr. and Mrs. H. H. Harrison, J. E. Burdsall, Fred Harding, Mr. and Mrs. H. H. Latimer, Mr. and Mrs. H. T. Randall, T. M. Chenerys, K. L. Jackson, Edward Lum, Mr. and Mrs. L. E. Longstreth, Fred E. Moser, R. B. Roe, Mr. and Mrs. R. G. H. Smith, Mr. and Mrs. G. H. Suhs, Mr. and Mrs. J. Linville Mullins and son, Mr. and Mrs. D. D. Patrick, Myron Wittmer, Mr. and Mrs. C. W. Richards, Mr. and Mrs. Douglas Robbins, Mr. and Mrs. Gilbert Sincox, Mr. and Mrs. Harold Sinclair, P. R. Schreiber, Mr. and Mrs. R. H. Smith, Mr. and Mrs. A. J. Smith, E. Thomas, Robert Weber, Carl Roess, H. H. Ritz, J. C. Ritz, and Allan Hyer.

Ask Bids for Paper

(Continued from page 13)

755,000 pounds kraft paper.
1,500 pounds paraffin paper.
400,000 sheets gummed paper.
152,000 pounds blotting paper.
2,500 pounds stereotype molding paper.
30,000 pounds oiled manila tympan paper.
3,000 pounds plate-wiping paper.
3,000 pounds back-lining paper, for case making.
7,000 pounds high finish red sulphite.
80,000 pounds manila tag board.
1,330,000 pounds calendered tag board.
30,000 pounds manila cardboard.
175,000 sheets railroad board.
410,000 pounds bristol board.
6,000,000 pounds United States postal card bristol board.
35,000 sheets pressboard.
5,000 pounds news board.
1,010,000 pounds chip and strawboard.
15,000 pounds marble grained board.
36,000 pounds box board.
380,000 pounds binder's board.

In cases where more than 1,000 reams are called for, proposals will be received for 1,000 reams or more.

Glassine Co. Buys McDowell Mills

The Glassine Paper Company announces that it has acquired the mills and business of the McDowell Paper Mills, Manayunk, Philadelphia, Pa., which it will hereafter operate as the McDowell Paper Mills Branch of the Glassine Paper Company.

In making this announcement, the company says, "It is our wish to carry on this over a century old business in a manner that will be both pleasing and profitable to our customers—both old and new.

"Both The Glassine Paper Company's mill at West Conshohocken, Pa., and the McDowell Paper Mills, Manayunk, Philadelphia, Pa. will continue to be at your service for the production of fine and serviceable glassine and greaseproof papers, and waxed and laminated specialties.

"We shall be pleased to receive your inquiries addressed either to the Glassine Paper Company, West Conshohocken, Pa., or McDowell Paper Mills, Manayunk, Philadelphia, Pa."

Japan Increases Paper Production

Production of machine-made paper by the members of the Japanese Paper Manufacturers' Association amounted to 87,149 short tons during May, an increase of 1.3 per cent over the output of the previous month and a 7.8 per cent gain over the May 1938 production. Total production of paper by the members of the association for the first 5 months of 1939, amounted to 410,164 short tons, an increase of 18,409 tons or 4.6 per cent over the output for the corresponding period of last year.

R. L. Martin Dead

The death is reported of R. L. Martin, superintendent of the mill at Richmond, Va. and assistant manager of the mill at Roanoke Rapids, N. C. of the Manchester Board and Paper Company, Inc.

Kalamazoo TAPPI Discusses Fungicides

The Kalamazoo Valley Section of the Technical Association of the Pulp and Paper Industry, held its first meeting of the 1939-40 season Thursday, October 5th, at the Park American Hotel in Kalamazoo. Forty seven attended the meeting.

After dinner Chairman Kirkpatrick introduced the first speaker of the evening: D. K. Ballman of the Dow Chemical Company, Midland, Michigan, who spoke on "Dowicides." He confined his talk mainly to the use of fungicides in the paper industry. He said they are used to preserve lap stock pulp, especially groundwood; to prevent decomposition of coating adhesives such as casein, starch, or protein; and in specialty papers as in the case of soap wrappers to prevent mold, egg papers to prevent contaminating odors, and lowering the bacteria count of papers for food stuffs. The common method of applying the fungicide is either to spray it on or apply it at the calender. In some instances, as for food stuff papers, the fungicide may be added to the beater. Mr. Ballman also stated that fungicides are being used to prevent felts from rotting out and in slime control. The Dow Chemical Company now produces commercially about 20 different Dowicides and each has its own specific field of operation.

The next item on the program was a movie by Johns Manville Corporation on "Celite, the Story of the Diatom" which showed just what Celite is, how it is mined and processed, and the uses to which it is put in various industries, such as paints, lacquers, industrial filtration, soaps, abrasives, etc. Following the movie P. A. Martinson of the Johns Manville Corporation described the use of Celite as a paper filler, where it is said to raise the bulk, improve retention, and increase ink absorption. A lively discussion followed his talk.

The next meeting will be held at the Park American Hotel, Thursday, November 2nd. W. O. Wheeler of the Appleton Machine Co., Appleton, Wisconsin, will speak on "Calender Developments," and Mr. W. L. Savell of the Mathieson Alkali Co., New York City, will talk on "Recent Developments in Pulp Bleaching."

D. K. Ballman, L. L. Griffiths, Jr., M. J. Keirn, K. J. Kimball, O. F. Hutchinson, Rolland Smith, P. A. Martinson, J. G. Wright, W. A. Kirkpatrick, Wm. Hamilton, G. J. Lane, O. W. Callighan, W. R. Tobin, R. P. Aument, H. H. Smith, A. Weinland, V. Rawlinson, Paul de Guehery, M. S. Fogarty, A. E. Hays, G. F. Des Autels, W. F. Hathaway, Marshall Rutz, C. C. Schneider, N. J. Cowie, John Tooker, E. F. Whittington, H. C. Bradford, Joe Waber, A. W. Cole, F. C. Peterson, R. M. Upright, R. D. Freeman, H. M. Gilk, J. A. Heenan, D. B. Bachelder, W. K. Kidder, R. A. Olson, M. R. Wilkins, J. L. Russell, R. T. Mashburn, F. L. Chappelle, J. W. Burke, M. J. Loveland, H. F. Kleinman, R. R. Buss, H. V. Heinmueller.

Increase Woods Operations

Woods operations of the Canadian pulp and paper industry will this season be at a level approximately 20% in excess of last season, according to present plans. This will mean that some 20,000 men will be employed. At the present time wood piles have been substantially reduced, but it is expected they will be back to normal in a few months.

Pacific TAPPI Meets at Seattle

The first in the 1939-40 term of dinner meetings for the Pacific Section of the Technical Association of the Pulp and Paper Industry was held at the Hotel Edmond Meany in Seattle, October 3, 1939 with 63 members and guests in attendance. In the afternoon prior to the dinner at 6:30 out of town visitors were extended the privilege of visiting the Chemistry and Chemical Engineering laboratories at the University of Washington.

In accordance with previous announcement of September 1, there was a short business meeting, preceding the dinner program, at which Fred Olmstead, Vice-Chairman presided and reported that the Nominating Committee and the Executive Committee recommended that Mr. Coster be elected to succeed himself as Chairman of the Pacific Section for the 1939-1940 term now in progress. As there were no other nominations from the floor a unanimous ballot was cast and Mr. Coster assumed his duties as Chairman.

The program which followed consisted of a talk by J. N. Tedford, Job Analyst in the Industrial Relations Department of the Crown Zellerbach Corporation, Camas, Washington, entitled "The Fundamentals of Wage Determination." Brian L. Shera, Service Engineer of the Pennsylvania Salt Manufacturing Company of Washington at Tacoma presented a paper relating to "Safe Handling of Chlorine and Caustic Soda in Pulp and Paper Mills."

The next meeting of the Pacific Section will be November 7, in Camas, Wash., details of which will be announced shortly.

Those present included:

Gerald Alcorn, A. J. Bailey, D. Earl Baker, John H. Baker, Walter R. Bauman, Iver E. Belsvig, Charles H. Belvin, Jr., Dr. H. K. Benson, Claire Bowman, A. M. Buck, Richard S. Buckley, A. M. Cadigan, John M. Carlson, Kenneth Chapman, R. E. Chase, N. W. Coster, J. V. B. Cox, E. F. Drake, H. H. Evans, Irving R. Gard, N. O. Gatteland, A. S. Gerry, William R. Gibson, Bror L. Grondal, D. Hamilton, S. H. Harrison, R. S. Hatch, Walter S. Hodges, Albert H. Hooker, Jr., W. F. Hynes, Frank G. Keuss, Carl R. Koch, Robert M. Kuhn, Fairman B. Lee, A. H. Lundberg, M. L. Mammen, Robert W. Martig, George Millard, T. E. Moffitt, Fred Nicholson, E. A. Norton, Walter W. Offner, F. A. Olmsted, Frederic M. Pape, Paul Pittenger, Carl A. Ramstad, H. A. Rehnberg, Ray Le Riche, Oliver E. Ronken, L. B. Robinson, Fred C. Shaneman, Harlan Scott, Brian Shera, H. N. Simpson, Lawrence K. Smith, J. D. Sullivan, P. E. Sullivan, H. V. Tartar, J. M. Tedford, V. L. Tipka, R. O. Vognild, Harold F. Warren, Edward C. Wood.

Finland Requires Permits for Pulp

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., October 11, 1939—A cablegram from the American Legation, Helsingfors, reported that Finnish Government decrees just issued require permits for the exportation of most products, including newsprint, wood pulp, turpentine, pine, and spruce logs and lumber.

It is reported that the above specified commodities are made subject to permit in order that exports remaining can be directed to countries from which necessary products may be imported.

IN THE BAG!

Bird Save-Alls are not sold like most paper mill equipment. The net return on the stock and water they recover is readily figured, taking into account all factors of cost. The Bird Save-All is simply a means of securing a net so substantial that the mill cannot afford to pass it up . . . On that basis, why not ask us to work out the figures for you?

BIRD MACHINE COMPANY, SO. WALPOLE, MASS.

BIRD SAVE-ALL

New Literature

Speed change units are discussed in Bulletin No. B6013 issued by the Allis-Chalmers Manufacturing Company, Milwaukee, Wis. Complete details of this variable speed transmission as additional equipment in the pulp, paper and other industries are given, including selection of proper units, installation, dimensions, horsepower and speed range tables.

Silent chains and sprockets are described in the new 64-page chain drive Catalogue No. N-135 issued by The Whitney Chain and Manufacturing Com pany, Hartford, Conn. Full information for the selection and design of Whitney silent chain drives, engineering data, dimensions, horsepower data and sprocket data are given. Illustrations of typical drives used in various industries are included.

Worm-helical speed reducers are covered in a new 16-page Bulletin No. 75 issued by the W. A. Jones Foundry and Machine Company, 4401 Roosevelt road, Chicago, Ill. The complete Jones line in 15 standard ratios is given, ranging from ratios of about 40 to 1 to approximately 250 to 1, for all common motor speeds and horsepower ratings. Dimensions and typical installations of pulp tank drive, agitator drive, etc. are shown.

Water columns and gauges described in water column Bulletin No. WG-1807, just issued by the Yarnall-Waring Company, Chestnut Hill, Philadelphia, Pa., replaces current Bulletin WG-1807. It gives full details of the Yarway floatless hi-lo alarm water columns, with vertical or secure-inclined water gauges, dimensions and prices. Bulletin H-209 replaces Builetin H-2-C, describing the Yarway 3-way hydraulic valves for pressures up to 5000 pounds, with dimensions and prices.

Power transmissions is the subject of Bulletin No. 75 just issued by the Morse Chain Company, Ithaca, N. Y. It includes design data on the Morse round pin, self-lubricating, roller chain, with specification tables and sprocket types. The company's Kelpo free-wheeling clutch, and the complete line of Morse flexible couplings and universal drives are included.

Dual-air propeller type fans are described in two circulars issued by the General Regulator Corporation, 2608 Arthington street, Chicago, Ill. These fans are designed for all industrial requirements, where large volumes of air must be moved with a minimum consumption of electric current. The fans are of the highly polished airplane type, with mounting rings of cast aluminum and are dust and moisture proof.

Asten dryer felts are covered in a folder issued by the Asten-Hill Manufacturing Company, Scott's Lane, Philadelphia, Pa., which provides information on the extensive use of the company's product and states it is now used in 58 per cent of the paper mills producing many grades of paper and paper board.

A. G. Ballenberg to Head Drive

A. G. Ballenberg of the Morris Paper Mills has been selected to head the impressive Paper Division in the annual Chicago Community Chest drive, now getting under way. Leo S. Altholz of Inlander-Steindler Paper Company is to serve as the chairman of the Advisory Committee. Mr. Ballenberg will select a large staff of paper executives to serve in the various committees.

R. F. Walter Goes with Chemical

The Chemical Paper Manufacturing Company has appointed R. F. Walter (better known to his wide circle of friends as "Corb") to the position of Sales Promotion Manager.

Mr. Walter comes to Chemical with a broad background of experience. He was for many years with Strathmore and Rising, still more recently with Keith Paper Company and has a wide acquaintance in the paper and printing trades. His experience and knowledge in the field of printing papers should be of

R. F. WALTER

definite help both to the Chemical Paper Manufacturing Company and its distributors. His work will cover the field of advertising and sales promotion.

Mr. Walter's plans are not to make his a "desk job" but to spend as much time as possible in the field, believing that in this way he can best serve the paper merchant in the sale of Chemical's "Quality Papers for Daily Use".

Buy Pulp Testing Equipment

The first Southern newsprint mill recognizes the imperative need of close scientific observation and control of stock in process. Dr. Charles Carpenter, formerly chief chemist of the Herty Foundation Laboratory of Savannah, Ga., has been engaged as chemist.

Pulp testing equipment has been purchased from the Noble & Wood Machine Company, Hoosick Falls, N. Y., and includes complete sheet making equipment with automatic control and reuse of white-water and a Noble & Wood Cycle Beater.

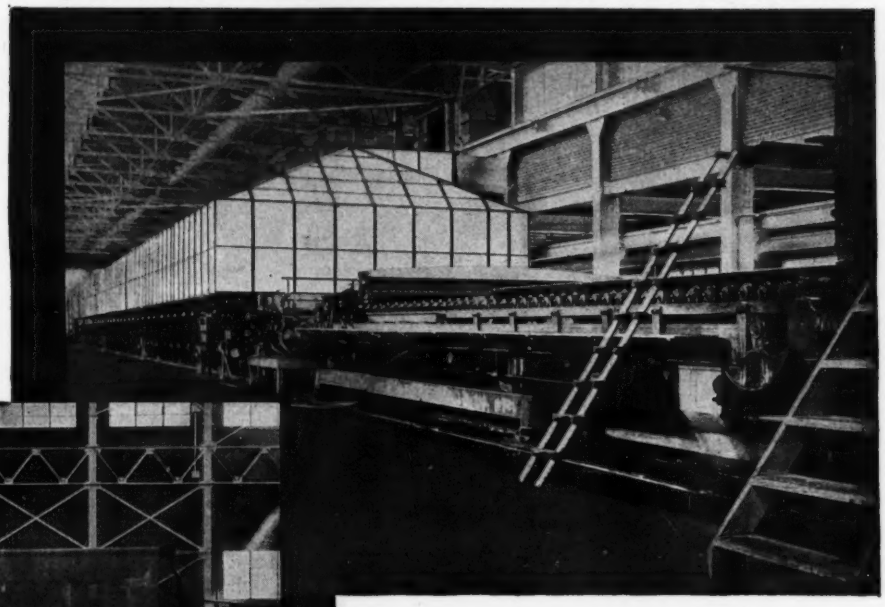
The sheet making equipment enables them to get reliable Mullen and Tear on uniform weight test sheets within seven minutes. With the white-water return the pH can be controlled and sizing tests carried out.

The Cycle Beater is built especially for pulp testing and will reproduce commercial beating results using 4 to 8 pounds of pulp at up to 5 per cent.

With this equipment a complete set of Mullen, Freeness and Tear curves on a sample of pulp may be obtained in approximately one hour.

THE BELOIT

Removable Fourdrinier



● Wire is strung in aisle while machine is in operation, if desired.

● Fourdrinier pit can be washed out while wire is being installed.

● Wire bundle is taken from shipping box and mounted directly in carriage—no chucks to apply—no further handling as bundle is unreeled as carriage moves along to form wire loop.

● All wire poles are mounted in carriage before loop is formed. Inside poles are inserted inside the wire.

● Safest — most convenient — quickest method of installing Fourdrinier wire.

THE BELOIT WAY IS THE MODERN WAY

BELOIT IRON WORKS PAPER MACHY BELOIT, WIS. U.S.A.

CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Financing and Operation of Pulp and Paper Mills

General Construction News

St. Louis, Mo.—The Envelope Manufacturing Company, 121 Clarke avenue, manufacturer of commercial envelopes and kindred paper specialties, has completed plans for new one-story converting plant on site at Leffingwell avenue and Pine street, to be 130 x 131 feet, estimated to cost over $75,000, with equipment. Erection contract has been let to the R. W. Morrison Construction Company, Wainwright Building, St. Louis, and work is scheduled to begin at early date. O. J. Krieg, Wainwright Building, is architect.

East Walpole, Mass.—Bird & Son, Inc., manufacturer of roofing papers, wall board and kindred products, has awarded general contract to MacDonald & Belbin, Inc., 83 Broad street, Boston, Mass., for proposed new addition to mill on Washington street extension, recently referred to in these columns. It will be one-story, used primarily for storage and distributing service, estimated to cost close to $50,000, with equipment. Erection is scheduled to begin at once. S. H. Kay is company engineer in charge.

Clinton, Iowa—E. I. duPont deNemours & Co., Cellophane Division, duPont Building, Wilmington, Del., has plans maturing for new mill near Clinton, where tract of land on Highway No. 67 was acquired a number of months ago. Project has been held in temporary abeyance since that time. Awards are now being made for grading of site, excavations and other land work, with contracts for erection scheduled to be made soon. Mill will consist of several one and multi-story units for general production, with equipment to be installed for large capacity. Also power house, pumping station, machine shop and other mechanical departments. Cost is reported over $5,000,000 with machinery. Company engineering department is in charge.

Wisconsin Rapids, Wis.—The Ahdawagam Paper Products Company, Wisconsin Rapids, has superstructure under way on new one-story, monitor-type building, 240 x 280 feet, recently referred to in these columns, designed to replace an existing older building and provide increased production facilities. Structural steel framing is being furnished by the Wisconsin Bridge & Iron Company, and work is being carried out by day labor, under supervision of George Marcoux, construction superintendent for the Ahdawagam company. The Grinnell Company, Providence, R. I., will furnish a sprinkler system. Cost is reported in excess of $100,000, with equipment. Thomas Utegaard is company engineer.

South Braintree, Mass.—The Armstrong Cork Company, Lancaster, Pa., manufacturer of insulation board products, cork board specialties, roofing and other felts, etc., has plans under way for four new additions to branch plant at South Braintree, consisting of a main two-story unit, 70 x 100 feet; one-story structure, 41 x 104 feet; and two smaller one-story buildings, each about 20 x 45 feet. Work also will include alterations and improvements in existing buildings. Bids on general contract are scheduled to be asked at early date. Entire project is reported to cost in excess of $85,000, including equipment.

Brooklyn, N. Y.—The Colonial Container Corporation, recently organized with capital of $100,000, plans operation of local plant for the manufacture of a line of folding paper boxes and other containers. New company is represented by Charles Entmacher, 450 Seventh avenue, New York, N. Y., attorney.

Manistique, Mich.—The Manistique Pulp and Paper Company, manufacturer of newsprint, is arranging for the purchase of its full quota of pulp wood during the coming season, totaling about 20,000 cords, with investment totaling close to $200,000. The mill is on full capacity schedule and will be maintained on such basis for an indefinite period.

Bellingham, Wash.—The Puget Sound Pulp and Timber Company has approved plans for new filtration plant at local mill, to be located on Laurel street. Erection contract has been let to the H. S. Wright Company, 407 Yale street North, Seattle, Wash., and work will proceed at once.

Kaukauna, Wis.—The Thilmany Pulp and Paper Company, Inc., manufacture of tissue and kraft papers, waterproof stocks, etc., has leased local one-story building owned by the Green Bay and Mississippi Canal Company, and will remodel and equip for a new converting plant, with storage and distributing facilities. An award for building modernization has been made to the C. R. Meyers & Sons Company, 50 State street, Oshkosh, Wis., and work is being placed under way. Structure will be occupied at earliest date.

Rocky Hill, Conn.—The Hartford Rayon Corporation, Rocky Hill, manufacturer of cellulose rayon products, has awarded general contract to Denis O'Brien & Sons, Inc., 190 Trumbull street, Hartford, Conn., for two new additions to mill, previously referred to in these columns, comprising a three-story unit, to be equipped as a recovery division for the production of salts, and one-story structure for storage and distribution. Cost estimated close to $75,000, with equipment. Work is

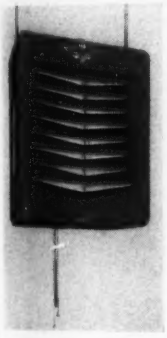
being placed under way. Company recently secured an RFC loan in amount of $400,000, to provide funds for this and other expansion and improvements at mill.

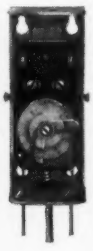
Brampton, Ont.—Gummed Papers, Ltd., manufacturer of gummed and other processed paper stocks, plans modernization and improvements in mill, with installation of additional equipment for increased output.

Montreal, Que.—The Lawson Litho and Folding Box Company, Ltd., 6629 Esplanade avenue, manufacturer of folding and other paper boxes and containers, has approved plans for new addition to plant, consisting of a three-story and basement structure, reported to cost over $50,000, with equipment. H. C. Johnstone & Company, Ltd., 1502 Ste. Catherine street, West Montreal, has been awarded general erection contract and will proceed with superstructure at once.

Individual Automatic Control Now in Thermolier Unit Heaters

Built-in individual automatic control of both day and nighttime temperatures, at unusually low cost, is now provided in Grinnell Automatic "Thermolier" Unit Heaters, made by Grinnell Company, Inc., of Providence, R. I. The control is also easily added to existing unit heaters of any make, as it requires merely to be tied into the line at the heater itself, completely eliminating the high cost of special wiring.





Heart of the device is a bulb-type thermostat containing a solid liquid charge, mounted within the heater housing. Two pointers—one for day, one for night—are quickly adjusted over a 60° range by someone in authority and locked. Thereafter, day and night settings are made by a simple pull-cord control hanging from the heater. A special setting makes possible summer operation of the fan alone, under automatic thermostat control, without additional wiring or other changes.

Complete information on both the Automatic Thermolier embodying the new device, and on the low-cost control itself, will be sent on request by the Grinnell Company, Inc., Executive Offices, Providence, R. I.

Paper Board Production Increases

A 24.7 per cent increase in production of paperboard during the first eight months of this year compared with the same 1938 period, is announced by the Census Bureau, Department of Commerce.

Production in the first eight months totaled 3,018,869 short tons compared with 2,420,848 short tons during the corresponding period of 1938. New orders for 3,051,321 short tons were received during the first eight months of 1939 compared with 2,427,928 last year.

PAPER TRADE JOURNAL

Title Reg. U. S. Pat. Off.

Henry J. Berger
EDITOR

Ronald G. Macdonald
Editor Technical Section

Lynne M. Lamm
Washington Correspondent

Vol. 109 New York, October 19, 1939 No. 16

COMING EVENTS IN PAPER INDUSTRY

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—Second Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

BUSINESS STEADILY EXPANDS

With the economy of several great nations in Europe radically changing from a normal state of free international trade to a regimented industry with a premium placed on armaments and the conscription of man power, these changes are beginning to have their effect in this country. Hostilities abroad have created new indebtedness, taxation and destruction of capital. In Germany we are told that "funny money" reminiscent of the "shin plasters" issued in this country during the Civil War period, has appeared; that Great Britain is embarking on a gigantic borrowing program which includes confiscatory inheritance taxes. Neutral investment markets, such as Amsterdam, are deeply concerned over the destruction of capital and the probability of the confiscation of extra profits. In this country, new security issues in September declined to $70,000,000, compared with $328,000,000 in August, and the Treasury has twice postponed refunding operations because of the unsettled bond markets.

The state of American business this week continues upward at a more moderate rate than in the last six weeks. The index of general business activity, with paper production above 92 per cent and steel production at around 88 per cent, to mention but two components of the index, now stands at 103 per cent. The strike in the Chrysler plant has prevented the great increase in volume forecasted in the automobile industry but production has made more than seasonal gains. From the current reports on business it appears that new business has declined from the speculative or boom activity which culminated in a rush of buying a month ago. This condition is not viewed as indicating any important recession in general business activity but is interpreted as favorable for the future in providing a sound expansion of business. Hostilities in Europe have affected this country but the increased business directly contributed by the conflict has yet to materialize.

It is encouraging to note that the foundation of the current upswing in business is so largely built upon domestic needs. Although foreign developments have been most prominently in the news, domestic factors continue to remain of paramount importance, as over 80 per cent of the markets for almost every business is in this country. In fact, American business activity increased more in 1936 than in 1914-18, according to the October *Business Bulletin* of La Salle Extension University, which said in part: "In the last period similar to the present, the changes in volume of production were not greater than have occurred many times under peaceful conditions. For example, the rise in production, annually, for any of the European conflict years was less than had occurred in 1912 or 1909, or in 1936.

"Contrary to viewpoints widely held, periods of hostilities are not always times of rising production. The peak of production in the last conflict was November, 1916. After that, the index of industrial activity declined until four months after hostilities had stopped. This decline took place in spite of the fact that the excess of exports during that two-year period amounted to over $3,000,000,000 annually. Even large foreign purchases do not guarantee an increase in general production in this country unless domestic conditions are suitable. The future course of business will be influenced, of course, by outside factors, but these need not entirely control. The more widespread, normal domestic factors may be even more significant than the exceptional and unusual ones."

The vigorous championship of the cause of peace by the Chamber of Commerce of the United States has been of constructive value in pointing out the slight temporary benefits gained through hostilities in Europe. President Carey of the Chamber recently followed up his earlier message to the membership with a nationwide radio talk on "Let's keep our balance", in which he issued strong warning against "an upward and unbalanced spiralling of prices and costs of production". He cautioned against a price boom. Certain increases may be necessary and desirable, he advised, but the process should be moderate. "Along with this question of prices", he said, "is that of wages and salaries so dominatingly important in costs of production. As in connection with prices, improper trends here might be disastrous." Thus far business generally has shown admirable self-restraint, states *Washington Review* of the Chamber of Commerce of the United States, in preventing abnormal price rises. Continuation of a policy of voluntary price control will redound immeasurably to the credit of business and will prove a powerful argument against efforts to impose governmental price controls.

A plan devised to utilize more middle-aged workers may prove of value in contributing more to the national income. According to reports of James J. Wadsworth, chairman of the Joint Legislative Committee Studying Discrimination in Employment of the Middle-Aged, a plan has been formulated by thirty-six Rochester industries, employing more than 35,000 workers, which if adopted will eliminate discrimination against persons of middle age. In this hiring policy, Mr. Wadsworth said, most of the Rochester employers have not changed their existing methods but have merely drawn upon their own experience to make concrete a policy which has never been publicly expressed. "The fairness of the formula", he said, "may be found in the fact that while approximately 42 per cent of the active file in the New York State Employment Office are over 40 years of age, 43 per cent of the employees in these industries are in the same age group."

Chemicals of Commerce

"Chemicals of Commerce" by Foster D. and Cornelia T. Snell, D. Van Nostrand Company, Inc., New York, N. Y., 541 pages. This book is a source of information on the composition of actual commercial products. Classification is by type of compound, so that closely related materials are referred to in the same chapter. Where feasible, relative cost is indicated, leading to economy in application.

Although some technical language is used, the book is primarily for the practical man. Among the subjects covered are acids, alkalies, petroleum hydrocarbons, alcohols, phenols, esters, fats and fatty oils, waxes, organic dyes, metals and metallic salts, natural gums, resins and balsams, synthetic resins, carbohydrates and proteins.

Method of manufacture are, in many cases, outlined briefly. This enables chemists to estimate possible impurities present. The important uses are outlined to suggest to prospective users other possible uses. Poisonous properties are stressed when they exist to an extreme degree and hazards in handling chemicals are mentioned in unusual cases.

Copies may be obtained through the Book Department of the Technical Association of the Pulp and Paper Industry, 122 East 42nd street, New York, N. Y., at five dollars per copy.

Shipping Association Prospers

[FROM OUR REGULAR CORRESPONDENT]

WATERTOWN, N. Y., October 16, 1939—The Northern New York Association, organized a few years ago to provide better and more economical shipping service of products from this section through pooling part carload lots into full shipments and thus getting the lower full-car freight rates, has developed a substantial business according to official announcement. During September 48 cars were loaded by the organization, aggregating 2,213,058 pounds of paper and paper products which was an increase over the preceding month. Every week the group sends cars from here to Chicago, Philadelphia, Baltimore and Boston.

Production Ratio Report

These statistics are based upon paper production reports to the American Paper and Pulp Association.

COMPARATIVE MONTHLY SUMMARIES[1]

Months	1939	1938	1937	1936	1935	1934
January	77.5%	63.9%	90.3%	76.1%	65.8%	.....
February	81.7%	68.7%	90.1%	77.9%	70.0%	.....
March	84.0%	69.6%	90.3%	76.0%	70.5%	.....
April	82.9%	68.3%	92.1%	82.3%	70.0%	.....
May	80.2%	69.0%	90.6%	81.6%	69.4%	.....
June	79.7%	66.0%	87.3%	80.7%	72.3%	.....
July	75.2%	72.0%	81.8%	77.3%	64.9%	.....
August	82.9%	77.2%	82.9%	81.5%	70.9%	.....
September	88.7%	76.3%	78.6%	80.5%	71.9%	58.2%
October	.....	82.5%	73.5%	87.6%	75.6%	64.7%
November	.....	79.6%	61.9%	88.0%	75.3%	61.7%
December	.....	74.4%	54.5%	85.9%	71.2%	59.6%
Year Average	.....	72.3%	80.6%	81.3%	70.5%	.....
First 40 weeks	81.6%	70.4%	86.6%	79.6%	69.6%	.....

COMPARATIVE WEEKLY SUMMARIES[1]

CURRENT WEEKS, 1939		CORRESPONDING WEEKS, 1938	
September 2	85.1%	September 3	77.5%
September 9	74.2%	September 10	66.0%
September 16	91.9%	September 17	79.6%
September 23	93.4%	September 24	78.4%
September 30	96.1%	October 1	81.1%
October 7	92.6%	October 8	81.6%

The following statistics show the number of mills reporting by ratio groups:

	Number of Mills Reporting—Current Weeks					
Ratio Limits	Sept. 2, 1939	Sept. 9, 1939	Sept. 16, 1939	Sept. 23, 1939	Sept. 30, 1939	Oct. 7, 1939
0% to 50%	60	59	45	33	32	20
51% to 100%	245	240	254	260	241	112
Total Mills Reporting	305	299	299	293	273	132

PAPERBOARD OPERATING RATIOS

(Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.)

Year	Jan.	Feb.	Mar.	Apr.	May	June	July
1935	62%	68%	68%	63%	61%	66%	62%
1936	62%	67%	67%	70%	69%	70%	69%
1937	80%	86%	86%	88%	85%	77%	66%
1938	54%	60%	61%	57%	58%	56%	57%
1939	60%	67%	71%	69%	64%	67%	63%

Year	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1935	67%	71%	77%	71%	61%	66%
1936	75%	78%	82%	80%	74%	72%
1937	74%	69%	65%	55%	45%	73%
1938	66%	66%	70%	65%	59%	61%
1939	72%	....	....	....	....	....

Week end. Sept. 2, 1939—73%
Week end. Sept. 9, 1939—63%
Week end. Sept. 16, 1939—79%
Week end. Sept. 23, 1939—80%
Week end. Sept. 30, 1939—82%
Week end. Oct. 7, 1939—84%

[1] Production-capacity ratios are based upon six-day capacity ratings which are adjusted periodically to correspond with the ratings reported by individual companies. Ratios are subject to revision until all reports are received.

Champion Elevates Two to V. Presidents

Alexander Thomson Jr., Cincinnati, Ohio, and Herbert T. Randall, Hamilton, Ohio, were elevated to vice presidents of the Champion Paper and Fiber Company, at the annual meeting of stockholders and directors. Mr. Thomson was formerly advertising manager and Mr. Randall consulting engineer. The announcement of the advancements was made by Logan G. Thomson, president of the concern and uncle of Alexander Thomson.

Officers and directors all were re-elected. They are Reuben B. Robertson, executive vice president; H. W. Suter, Reuben B. Robertson Jr., and Clarke Marion, vice presidents; Scott Zoller, secretary and treasurer; J. L. Henson, controller and assistant secretary, and Harry G. Pounsford, Charles C. Benedict, Cincinnati; Henry Bowers, New York; James M. Hutton, Logan Thomson, Alexander Thomson, Robertson Sr., and Suter, directors.

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Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

Some of the Paper Problems In Multicolor Offset Printing

By Charles G. Weber[1]

Abstract

Failure of successive color images to register, or fit properly one on top of another, is responsible for the most difficult problem in multicolor lithography in which paper is involved. The difficulties with register result from dimensional changes of the paper, which are caused by variations in moisture content. Progress has been made toward solving these problems by improved practice in the preparation and conditioning of papers. Papers with lowest expansivity in the machine direction give best results. However, the best papers obtainable require control of moisture content during printing for satisfactory results. To be properly prepared for multicolor printing, paper must be in equilibrium with relative humidity 5 to 8 per cent above the pressroom condition. Moisture content should be controlled from the time the paper is coming over the papermaking machine until the last color is printed on it in the printing plant. It is easier to obtain good register on a poor paper with proper control of moisture than on the best of papers without it.

Study of the paper requirements of modern offset lithography has been in progress for several years at the National Bureau of Standards. The purpose is to assist those connected with the two industries involved, offset lithography and paper manufacturing, to obtain more scientific knowledge as a basis for removing some of the most serious obstacles to economic printing. Imperfections of register attributable to the response of paper to the printing process have resulted not only in operating difficulties, but in serious economic losses through spoilage, decreased production, and impaired quality of the finished work.

The difficulties arise mainly from failure of successive color images to fit, or register, with respect to each other, and the basic cause is instability of dimensions of the paper during printing. Studies of the factors which affect register have been pursued at the Bureau, and results obtained have made possible advancements relative to the manufacture and treatment of papers for improved register. Accurate register can be obtained uniformly when the conditions of printing are adequately controlled.

[1] Member TAPPI, Assistant Chief of Paper Section, U. S. National Bureau of Standards, Washington, D. C.

The research on this subject at the Bureau is being done with the active cooperation and financial support of the Lithographic Technical Foundation, paper manufacturers, printing equipment manufacturers, and air-conditioning engineers. The studies are planned with the counsel of an advisory committee composed of technical representatives of the cooperating firms, under the chairmanship of Professor R. F. Reed, Director of Lithographic Research, University of Cincinnati.

Color Printing and Misregister

Offset lithography is very widely employed for multicolor printing. It lends itself readily to the reproduction of art subjects in original colors, and to the printing of photographic reproductions in natural colors. The number of colors ranges from 3 to 8 in most instances, but prints containing as many as 20 colors are not rare.

Lithography is based on the fact that grease attracts grease, and is repelled by water. The impression is made from a plate having an essentially plane surface. The printing design is formed with greasy ink, and the remainder of the plate is grained or roughened to hold water. In printing, water is applied to the entire plate, and wets the grained areas only. Ink is next applied and it, being repelled by the wet areas, adheres to the design only. Offset lithography differs from all other methods in that the paper does not come in direct contact with the printing plate. It employs an intermediate roll which is covered with a thin rubber blanket. The image is transferred from the plate to the blanket, from which the impression is received by the paper.

The individual colors are, in most instances, printed separately, that is, the paper is printed once for each color appearing in the completed print. In building up the print by thus adding the various colors one at a time, each color image must fit rather precisely with respect to the preceding color images or the quality of the reproductions will be impaired by what is known as misregister. The registering of colors involves the most serious problem in offset lithography so far as the use of paper is concerned.

There are numerous factors that may affect the register in multicolor printing, many of which have been isolated in the course of the studies at the Bureau and described in a previous publication, (*1*). Most

of the factors can be controlled by the pressman in the normal operation of a press. However, it is practically impossible to obtain satisfactory register if the length of the paper itself does not remain constant from the time the first color is printed until the final color image is in place. The failure of paper to remain constant is the most important cause of poor register, and it is by far the most difficult to control. In many classes of color printing, expansion of paper amounting to one-fiftieth of one per cent of its length during the printing of a multicolor job will prove serious, and a change in length of that order will result from a slight variation of moisture content. Changes in length have been commonly referred to as "paper stretch" because it was believed to be a mechanical deformation resulting from the pressure applied in printing. However, instances of actual stretch are surprisingly rare. The deformation is, in reality, an expansion that can be accounted for by variations in moisture content. These changes in length must be minimized for satisfactory register, and this requires the control of the moisture content of paper during printing in addition to the selection of paper with low expansivity. Completely satisfactory results require that the control of moisture content cover the entire period from the time the paper is formed on the papermaking machine until the final color is printed on it by the lithographer. The matter of control is not simple because of the hygroscopic nature of paper.

The Control of Expansion During Printing

Since changes in the dimensions of paper during printing cause the misregister, it might appear that the logical solution for failure to register would be the development of a paper that would neither expand nor contract. That would obviously solve the problem, but, unfortunately, such a solution does not appear probable, or at least not imminent. Paper is a hygroscopic substance. Its moisture content is affected by the humidity and temperature of the surrounding air, and by moisture from the wet plate used in printing. Variations in moisture content are accompanied by changes of dimensions. No sheet suitable for general printing purposes, but without the hygroscopic properties of paper, has yet been found. It is possible to produce paper with low expansion by employing certain control measures in its manufacture. Also, it is possible to minimize the moisture variations by proper control measures in printing. Hence, the most satisfactory solution of the problem of expansion during printing requires both types of control. However, good results are more easily obtained on a poor paper with the proper moisture control than on the best of papers without such control.

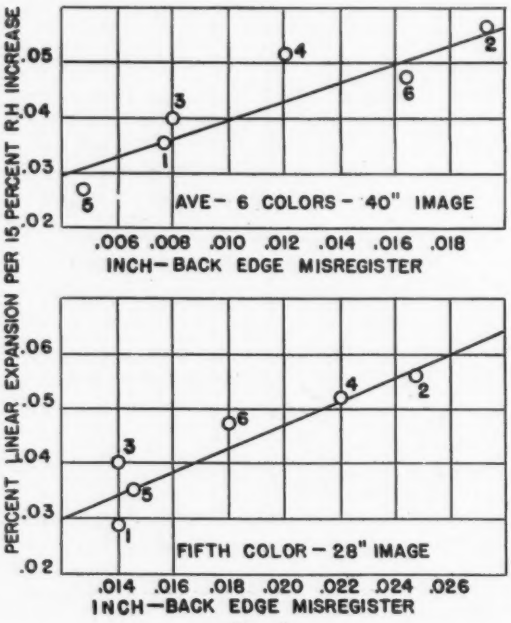

FIG. 1.

Relation of machine-direction expansivity of paper to misregister in printing.

PAPER CHARACTERISTICS

Inasmuch as misregister in the short, or around-the-cylinder, direction in printing can be corrected by press adjustment, only the expansivity lengthwise or parallel to the axis of the printing cylinder is important. The expansivity of paper is appreciably lower in the machine direction than across the grain, therefore, all offset papers are, or should be, cut with the grain, or machine direction, parallel to the long dimension of the sheet. The machine direction expansivity then becomes the important property affecting register, and other factors being constant, the misregister of prints increases directly with the coefficient of linear expansion in that direction. This relationship between the expansivity of paper and misregister in printing is indicated graphically in Fig. 1, which shows actual misregister for 6 papers having different expansion values.

It was found in early experiments at the Bureau that the expansivity of paper was affected to an important degree by the fiber characteristics of the paper (*1, 2*). Subsequent tests of a series of made-to-order papers have shown that chemical wood-fiber papers, made with a minimum of gelatinization of fibers and a maximum of directional difference or grain, have lowest machine direction expansivity, and, consequently, give best register. This desired type of formation can be obtained by control of the mechanical treatment of fibers in the paper manufacturing processes. The length of fibers should be kept at the maximum and gelatinization, or so-called hydration, at the minimum, by keeping both beating and jordaning at the minimum required for suitable strength and surface quality. A desirable paper is characterized by large directional difference or grain, due to fiber orientation. A high ratio of machine direction to cross direction folding endurance is generally indicative of good formation for close register in printing.

CONDITIONING FOR OPTIMUM REGISTER

The best paper obtainable with present methods of manufacture will be hygroscopic; the necessity for regulating the moisture content of paper is apparent. The length of paper is affected by its hygroscopic moisture through swelling of the individual fibers, and for the range ordinarily encountered, the swelling is proportional to the amount of water held. As a result there is an approximately straight line relationship between moisture content of paper and its length. This relationship is illustrated in Fig. 2.

It becomes obvious that stability of dimensions can be maintained during the printing only by stabilizing the moisture content. Paper is stabilized for other

purposes, such as for physical testing, by exposing it to an atmosphere of constant humidity and temperature until it reaches a constant weight, and then keeping the humidity and temperature constant. However, this procedure is only partially effective in offset printing. Papers conditioned to equilibrium with the pressroom air in a plant having constant humidity and temperature will subsequently absorb moisture and expand during the printing of the first five colors, owing to moisture from the press. The reasons for this moisture being picked up and held under these circumstances involves hysteresis effects, and will not be discussed here since they have been discussed in a previous publication (*3*). The solution of the problem requires special preparation of the paper which must be in condition to lose moisture to the air during printing at the same rate that it picks up moisture from the press. When printing with a normal amount of water on the plate, this will occur if the moisture content is somewhat above equilibrium with the pressroom air at the start of the printing. This optimum moisture content is obtained by conditioning to equilibrium with relative humidity 5 to 8 per cent above that in the pressroom, either in a room separate from the pressroom and under independent control, or in a closed conditioning machine with moistening attachment. The sword type of hygrometer (*4*) is a most convenient tool for determining the hygrometric condition of paper relative to the surrounding air, hence for determining whether or not the paper is in suitable hygrometric condition for printing. Its use is illustrated in Fig. 3 which shows the relation of the hygrometric condition of paper as indicated by readings taken with the sword hygrometer to register in printing.

These data are most important. They show not only the optimum hygrometric condition of paper for close register, but indicate to what extent a moist paper will give better results than a dry one. Paper no. 11, which was in equilibrium with the pressroom air, gave no better register than no. 41, which was wet by approximately 2 per cent of moisture content. No. 1, which was dry relative to the pressroom air to approximately the same extent that no. 41 was wet, gave 4 times as much misregister. Optimum results are obtained with papers conditioned to give a moist reading on the sword corresponding to no. 21 in the illustration. This practice has been followed in commercial printing with most satisfactory results.

Precautions in Printing Plants with Controlled Relative Humidity

Where facilities cannot be provided for controlling the relative humidity in the printing plant, close register is extremely difficult. Serious difficulties can usually be avoided, however, by taking certain precautions. The paper should always be carefully checked with the sword hygrometer before the start of each color printing, and the first printing should never be started when the paper is dry with reference to the room air. Subsequent printings should not be started when the sword reading differs greatly from what it was for the preceding color, and the paper should always be protected from humidity changes between printings by use of moistureproof covers. If this procedure is followed, the most serious disadvantage incurred by lack of conditioning facilities will be loss of time, due to inability to print on days when the humidity varies too widely from the condition under which preceding colors were printed. The paper manufacturer can help the situation by adjusting the moisture content of the paper to conform to normal seasonal variations. The moisture content of paper to be used in an unconditioned plant during the summer months should be high enough to correspond to the average outdoor humidity for the locality. Paper to be printed during the months when heat is used in the pressroom, should have a moisture

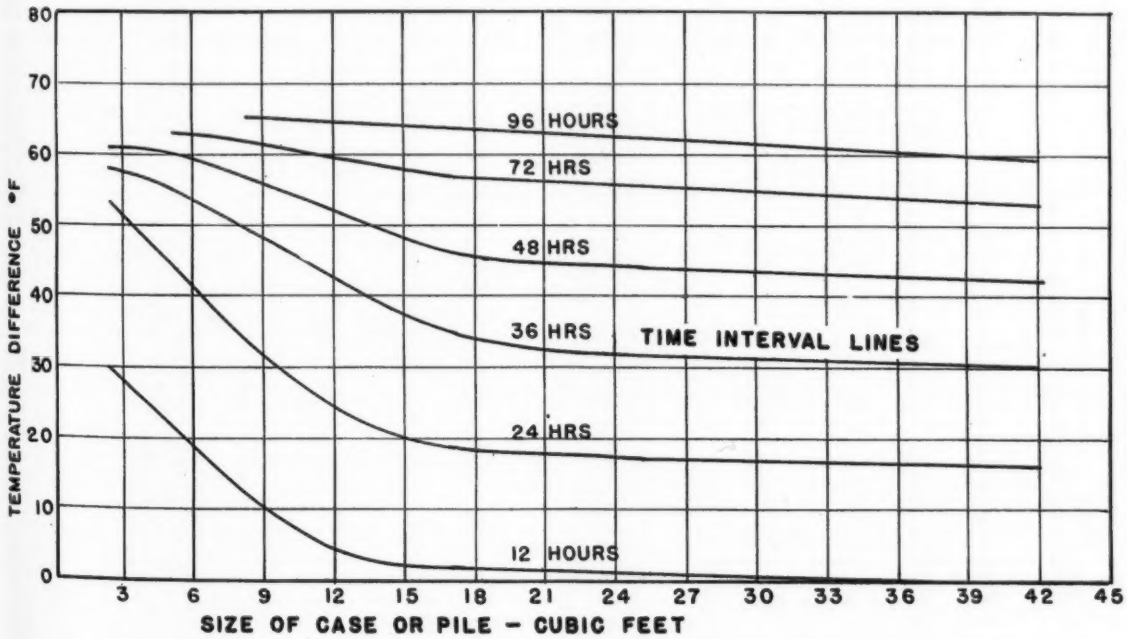

Fig. 2.

Influence of variations in moisture content on length of lithographic papers.

content corresponding to not over 35 per cent relative humidity.

Temperature-Conditioning of Paper

Serious difficulties are often caused by failure to give proper attention to the temperature-conditioning of cold paper. When a case or skid of cold paper is exposed to the atmosphere of a pressroom by removing or breaking its moistureproof wrapper, the moisture content of its exposed edges will increase rapidly, through condensation of moisture from the warm air in contact with it. This is particularly true in conditioned rooms where the dewpoint temperature is in the neighborhood of 50 deg. F. Expansion of the paper at the edges, caused by the increase of moisture content, causes serious distortion in the form of wavy edges. This takes place so rapidly upon removing or breaking the waterproof seal that it can be prevented only by leaving the covering sealed until temperature equilibrium has been reached. Owing to the slow rate of temperature change of paper in cases or piles, considerable time is required, as is shown on the chart in Fig. 4. The approximate time required to bring a pile of paper to equilibrium with the temperature of the room air can be obtained from this chart.

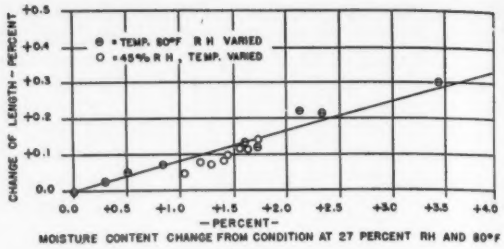

FIG. 4.

Temperature-conditioning chart for paper in cases, or in covered piles as on skids.

Miscellaneous Paper Defects

The hygroscopic qualities of paper, in addition to their effects on register, contribute largely to several other commonly encountered defects. The defects are wavy edges, tight edges, buckling, and curling. These defects result largely from improper handling, and can be corrected in most instances. Wavy edges, a very common complaint, are caused by exposing relatively dry paper in the pile to the atmosphere. The exposed edges absorb moisture and expand to cause the wavy effect near the edges. Tight edges and buckling are caused by similarly exposing relatively moist paper. The loss of moisture from the exposed edges causes them to contract and tighten, and when they become too tight the pull at the edges causes the paper to buckle.

Paper that is properly protected against moisture changes in transit and storage by the use of a moistureproof wrapper will not develop wavy or tight edges and buckling until the wrapper is removed or broken. These troubles can be largely avoided if the paper is conditioned immediately after breaking the wrapper. In plants without humidity control, moistureproof covers should be kept on all paper from which the wrappers are removed. If the defects are

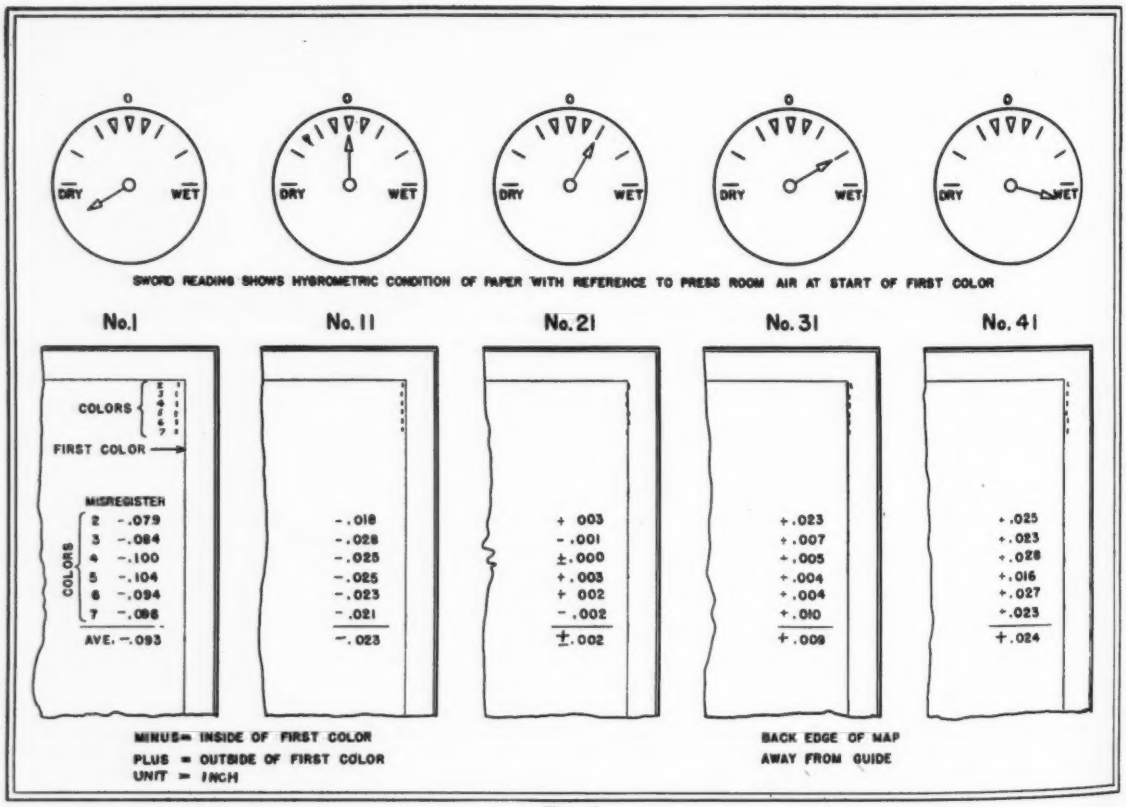

FIG. 3.

Relation of paper conditioning to register.

found to be present when the wrappers are first removed, the paper manufacturer is normally assumed to be at fault as the paper was defective when wrapped at the mill or the wrapper did not properly protect it in transit and storage. A good grade of asphalt duplex paper may be regarded as the minimum quality of wrapper that should be used, and all joints should be lapped several inches. The use of sealing tape to hold the lapped edges firmly in place is recommended.

Curling of paper is a defect familiar to all printers. The causes are numerous and often quite complicated. There is no general rule that can be applied for the correction of curling troubles. For the plant with controlled humidity, they will be reduced by having the paper furnished with a relatively high moisture content, and by conditioning promptly if conditioning is required. In an unconditioned plant, paper should never be exposed to extreme conditions of humidity, particularly to extreme dryness. Instances of stubborn curling should be the subject of joint investigation by the printer and the paper manufacturer.

Recommended Practices

It is highly desirable that the relative humidity of the offset pressroom be controlled within close limits and paper should be prepared for printing by conditioning to equilibrium with relative humidity 5 to 8 per cent above that of the pressroom.

The conditioning of paper is greatly facilitated by having it delivered to the printer with the proper moisture content. The ideal condition is to have paper delivered with its moisture content adjusted to equilibrium with relative humidity 5 to 8 per cent above the humidity of the pressroom atmosphere. For the sake of convenience and accuracy, the moisture should always be specified in terms of relative humidity, and not as percentage of moisture.

For example, a printer operating his pressroom at 45 per cent humidity should specify that the moisture content be in equilibrium with 50 to 53 per cent relative humidity at normal room temperature. Specification of the actual moisture present is *unsatisfactory* because the equilibrium moisture content of paper will vary widely for different papers, and even for different runs of the same paper; hence, any absolute value is of doubtful significance.

For the unconditioned pressroom, attention to the relationship between the moisture condition of the paper and the surrounding air is most important. Paper with high moisture content should be required during all except the winter season when relatively low humidity in the pressroom is caused by the use of heat within the building. No color printing should be started when the paper is dry relative to the room atmosphere.

The sword-type hygrometer should always be used to determine when paper is in the proper hygrometric condition for printing. For fine register, paper should be "wet" relative to the pressroom air by 0.5 per cent of moisture as determined by the sword, at the start of the first color printing.

The expansivity of paper should be kept as low as possible by attention to fiber treatment in its manufacture. Length of fibers should be kept at the maximum and hydration at the minimum by keeping both beating and jordaning at the minimum required for suitable strength and surface quality.

All paper leaving the mill should be protected with moistureproof wrappers. The wrappers should never be broken while the paper is colder than the surrounding air, and when the wrapper is broken, the paper should be conditioned immediately, if its moisture content is not already properly adjusted for printing.

Literature Cited

(1) Weber and Cobb, *Bur. Standards J. Research* 9, 427 (1932) R P 480.
(2) Weber, J., *Bur. Standards J. Research* 13, 609 (1934) R P 730.
(3) Weber and Geib, J., *Bur. Standards J. Research* 16, 93 (1936) R P 859.
(4) The Paper Hygroscope, Lithographic Technical Foundation Bulletin.

New TAPPI Members

The election to membership in the Technical Association of the Pulp and Paper Industry of the following technicians is announced by R. G. Macdonald, secretary:

Peter J. Abel, engineer, Stickle Steam Specialty Company, Indianapolis, Ind. received his education at the University of Notre Dame and has been with his company for 12 years.

Siegfried Block, (formerly manager and partner, Okriftal Cellulosfabrik, Germany) 5431 California street, San Francisco, Cal. received a Ph. D. degree from Munich University.

K. Darby Gallinger, 724 Nellis street, Watertown, N. Y. was formerly plant manager of Taggart Corporation and received his education at Cornell University.

W. Ronald Benson, technical supervisor, National Paper Products Company, division of Crown Zellerbach Corporation received his education at the University of Washington.

Alfred H. Nadelmann, industrial chemist, Milprint, Inc., Milwaukee, Wis. received a Ph. D. degree from the University of Berlin.

Arthur G. Wakeman, mill manager, Fox River Paper Corporation, Appleton, Wis. is a graduate mechanical engineer of the Massachusetts Institute of Technology. He was formerly with the Kimberly-Clark Corporation and Beloit Iron Works.

Percival P. Gooding, technical director, Strathmore Paper Company, West Springfield, Mass. is a graduate of the Massachusetts Institute of Technology. He was formerly with Eastern Manufacturing Company and in the U. S. Army.

Fred W. Sanders, assistant chemist, Cornell Wood Products Company, Cornell, Wis. is a graduate of Hendrik College.

Stanley J. Leishman, production manager, Ryegate Paper Company, Ryegate, Vt. received his education at McGill University. He was formerly with Howard Smith Paper Mills.

Stanford G. Blankinship, general superintendent, Brown Company, Berlin, N. H. received his education at Massachusetts State College and has been with the Brown Company for 20 years.

C. E. Carpenter, Ohio Boxboard Company, Rittman, Ohio is a graduate mechanical engineer of Cornell University. He was formerly with Arthur D. Little, Inc., Great Eastern Paper Company, Brompton Pulp and Paper Company and International Paper Company.

Charles H. McCollam, chief chemist, Timken Roller Bearing Company, Steel and Tube Division, Canton, Ohio, has been with this company for 17 years and was formerly with the General Electric Company.

Paper Machine Coating Processes*

By Peter J. Massey [1]

Abstract

A review of the existing processes relating to coating of printing papers on the paper machine. Comments on the principle involved and mention of printing developments.

Consideration is given to costs involved and the nature of the coating mix.

My presence before this assembly in no way implies familiarity on my part with the technical operations involved in all the various processes for coating paper. The scope of this paper was conceived by your Secretary, and I regret that I am unable to comply fully with his outline. To trace the development of coating processes requires more applied knowledge and considerably more time than is available to me; any attempt to cover so wide a field would lead me beyond the bounds of my own specialized interests and studies. Therefore I hope you will bear with me in this presentation which is only a digest of my experience and opinions on the coating processes.

While much of the material which I shall cover deals with subjects on which I have done considerable original work and of which I can speak with first hand knowledge, I want to acknowledge, with sincere appreciation the aid extended by other members of this association in the development of a number of coating processes and in the preparation of this paper.

The success or failure of any commercial product is based primarily upon its filling a need or desire of society. The old bromide, "Necessity is the mother of invention," still holds true and is particularly applicable to our subject, since the evolution of various coating processes is due to the paper industry's attempt to meet the needs and requirements of its customers. The major portion of our operations today are based directly upon servicing properly the subsequent operations on our product such as printing, waxing, etc. The modern developments in printing, as an example, would have been impossible without parallel developments in paper making. It is obvious that this and all other progressive developments in our industry which have been made possible by the applied technical knowledge of the past twenty years, have been motivated by our desire to give service to our customers. The limitations of this service are due only to the paucity of our technical knowledge of our customers' requirements.

At this point, I should like to state some generally accepted, self-evident truths, directly applicable to printing, but basic truths which also apply to other conversion operations. These propositions have been taken as an axiomatic basis for a technical philosophy by our successful manufacturers of printing papers. They appeal to us because they enlarge our vision, because they bring the main problem within our grasp, and because they stimulate the spirit of scientific adventure which still survives in many of us.

1. Paper is defined as a network of cellulose fibers.
2. No paper strictly conforming to this definition is fit for printing.
3. The higher the impurity of the cellulose network the better the printing values.
4. Using the network of cellulose fibers as a framework for a mineral such as clay improves the printing qualities in direct proportion to the percentage of clay retained on the surface of the sheet.
5. The ideal printing sheet is one having the perfect plane produced with a 100 per cent mineral surface, the Coated Sheet.

Now we shall proceed from these axioms to a discussion of their practical application to the development of the coating process, as the demand for coated paper developed on the part of the consumers, in this case the printing industry. When the half tone process of printing was evolved, it was a commercial failure at its inception because no paper produced at that time, with the exception of expensive plated paper, had an even enough surface to receive the impression of the image without distortion. The paper industry met this need by finally evolving a sheet of paper with a mineral instead of a cellulose surface. The basic idea embodied in this first sheet of coated paper has been since and is still the guide to our efforts to produce satisfactory printing paper.

Condition Changes in the Graphic Arts

Coating paper has been standard practice ever since for the production of half-tone printing, but because of its high cost it has been limited in its general application to the better grades of advertising matter and to class magazines and periodicals of limited circulation. In the meantime great changes have been made in the graphic arts, so great that their impetus has been sufficient to make the problem of coating paper the most important work of our executives and technical men today.

With the exception of the four color press and some increase in the operating speed of its rotary presses, there has been no advancement in the letter press branch of the industry for over thirty years. In the last five years, however, this branch of the industry has perfected new developments important enough to challenge once more the newer branches of the industry. These changes have been brought about by two factors: First, rotogravure and offset were making serious inroads in the business done by letterpress; second, the principal customers required improved quality and service. Rotogravure, with its continuous tone effects and its improved economy of operation, had taken a considerable proportion of the business of illustrated publications and mail order catalogs. Offset, also, in a smaller measure, enlarged its volume at the expense of letter press, due primarily to its plate development and the economy of operation due to higher speed, two and four color units, and roll feed perfecting presses.

With the advent of the radio and the cheap auto, the publishing field was confronted with the most serious competition for the public attention it had ever had. Every publication, with the possible exception of trade and scientific journals, felt this competition and the mortality rate on publications went skyrocketing. The time factor in printing became an increasing handicap as any news in magazine publications was long discounted by radio and the daily press. The public wanted its news when it was news and given them in the quick snappy manner of the

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Roosevelt Hotel, New York, N. Y., Feb. 20-23, 1939.

[1] Vice-President, Combined Locks Paper Company, Combined Locks, Wis.

radio. The publishers, armed with these facts and the knowledge that the public could still be made to read providing the news and reading matter were well illustrated, thereby enabling them actually to visualize events, demanded that the printer equip himself with the necessary means to produce a high class illustrated publication at newspaper speed, before radio put in television. The full embodiment of the idea we now see in *Life* magazine, although in a smaller measure all other publications have accelerated their tempo to suit the new tune of public taste.

Previous to this "revolution" in types of reading matter, the physical constants of paper for letterpress printing were primarily based on the speed and type of folder on the press. In conformity with this situation, plane surface, absorbency, and ink receptivity were stressed. Therefore, the industry evolved unsized water leaf papers with various types of loading including calcium carbonate to meet the demand for greater brilliancy in color for the publisher and improved printing qualities for the pressroom. That some of the demands from the publisher were not compatible with improved printing quality is not within the scope of this article.

Now that we have traced the revolution, rightfully so designated, in publicity and therefore in printing, let us return to the immediate subject of this paper and discuss the parallel changes in paper production, developments which have been stimulated by the demands of the customers. The coating process itself has remained practically static in the interim, this branch of the industry being satisfied with the normal increment in the tonnage made available by our increased advertising demands. But the industry's efforts to meet the problem of producing a sheet of paper with all the physical and chemical constants of coated paper at the end of a paper machine without subsequent operations have been untiring. The success attending these efforts has been proportional to the development of the technologic data covering the fundamental requirements involved. The problems were further complicated by the constant change in the printing processes themselves, thereby adding many requirements that apparently were contradictory and were unknown to the producer of coated paper as the use of his product was limited to the older and slower methods of printing.

Evolution of Machine Coating Process

The classification of these efforts by related groups, though not by chronological order, is embodied in the following outline of developments:—

A. Clay or other mineral loading direct to furnish in beater or fan pump. This was the initial step in an attempt by the industry to produce a paper with constants similar to a coated paper on the paper machine. The results were directly proportional in value to its density and the amount of mineral on the surface of the sheet. This was the "imitation art" and magazine paper for over twenty years. While it did not approximate a coated sheet, it did improve the printing values and was superior to the unloaded sheets in its acceptance of the half tone printed image.

B. Suction couch rolls and higher speeds intensified two sidedness and evolved the next step which was designed primarily to reduce or eliminate two sidedness caused by these mechanical changes or by freeing the stock to operate on higher speeds. The Paraprint application at the guide roll exemplifies this step as applied at the fourdrinier wire. The Wheelwright patent, granted in 1916,, covered a process for the simultaneous application of surface sizing to both sides of the sheet at the last wet press, and even suggesting that "colors, loading materials, etc." can be added to the starch. The Traquair patent is another example of the application of this idea at the presses.

C. The next approach was through application of mineral on the wire either at or before the dandy. The Fair system provided for a flow onto the wire with the device operating well down toward the suction boxes so that the pigment and size might be fairly well concentrated at the surface. This and Johnsen's similar process of application on the felt side of the web in combination with the Para-print or Bair procedure was a progressive step forward, and the product was an improvement over the "imitation art" papers.

D. The fourth class of coating expedients consisted of applying coating or color to a web of paper in varying quantities by means of rolls, brushes or both and thereafter troweling, smoothing, and removing the excess coating applied to the paper with various roll combinations to produce a level coated surface on the paper web of which the Parker patent is an example. The methods in this class of coating make possible the application of heavier films, but special drying arrangements were needed for setting the surface before it contacted the drier. Under these conditions, therefore, only one side is surfaced at a time.

E. The fifth approach consisted generally in applying the coating in excess quantity to the web by means of sprays, brushes, or the like. This so-called "air-brush coater" machine consists essentially of an applicator roll for applying an excess of coating to the stock, and then removing the excess from the web surface by means of "air knives," flat jets of air in the form of a blade for doctoring off the excess and leaving a level coating of the desired weight. The Lebel patent is an example, and the Champion patent makes use of the same principle with a mechanical doctor.

F. The sixth class or type of coating methods consists in passing the web between two rolls and supplying an excess of coating material to the nip of the rolls, the pressure at the nip and between the two rolls being utilized to determine the quantity of color applied to the web. In some of the variations of this principle, a felt is used to supply the coating to the roll surface or to pass through the nip with the web and apply the coating by direct transfer, the nip pressure doctoring off any excess. Another variation of the same principle is to pass the web into a tub of coating for application to the bottom side of the web and flow or shower an excess of coating to the top side of the web, the pressure at the nip between the two rolls being the determining factor on quantity control. The Germanson patent is typical of this class of devices.

G. The seventh class, exemplified by the Massey patents, operates on the principle of preparing a previously determined amount or quantity of coating into a perfect film of substantial weight and thickness which is then applied as such simultaneously to both sides of a web of paper. This is done by rolling pressure without further working or operating upon the coating after it is applied to the web. This technique calls for a type of color or high solids with plasticity predominating over flow property.

Fundamentals Involved

We have now considered the different types or classes of coating methods which have been and are being evolved to meet the new demands of printers and public. Advancement in the production of coated paper on the paper machine has progressed with the improvement and advancement of our own technical knowledge of the physical and chemical constants of the factors involved. The application of a mineral film to a paper web is a precision operation and involves the development of precision instruments to function at the widths and speeds of our present machines. The problems in mechanics and dynamics are new and have required time for their solution. The physical and chemical constants of mechanical means and the component parts of the coating, as well as of the complex mixture itself, had to be found before we could evolve the "color" or coating that would fit the mechanical means of application. In fact, it is only since colloidal and physical chemistry have emerged from laboratory terms to actual scientific laws that we have been able to develop coating suitable to our means of mechanical application.

The recent advances in scientific knowledge have, however, equipped us with the means to meet our problem. Without this information it would be impossible to meet the situations of today. A few of the developments that have assisted materially in this advancement are:—

Mechanics:
Deflection; dynamic balance; roller bearings; forced lubrication; speed change; surface hardness; compressed air; corrosion; power transmission and simplified electrical control.
Physical Chemistry:
Particle size; peptization; enzyme conversion; wetting; surface tension; viscosity; absorption; plasticity; adhesive strength and lubrication properties of such materials as clays and other pigments including color pigments, starches, gums, glues, soyabean flour, casein, glycerides, alcohols, sulphonated oils, wetting agents, soaps, and dehydrating agents.

Printing Developments

So, looking back over these parallel developments of new printing processes and new uses for printing and of new methods of producing paper for these processes and uses, we are impressed with the fact that in all these developments, the only paper to function satisfactorily enough for publisher and printer to warrant new investment and in many cases increased costs was coated paper. To enumerate a few of these new developments, the requirements of which have been met with coated paper:—

Four color rotary perfecting presses with folders
Vaporin and other flash dry inks on high speed presses
Gloss inks
Inks with water as inside phase in vehicle
Aniline inks for art work

We see, then, that the paper industry apparently has had the means ready at hand to cope with the new requirements of printing and publishing. Now let us consider some of the problems and limiting factors of the present, immediate, and even more distant future which we have not yet entirely solved. When we discuss coated paper in this sense, we are not talking of a definite sheet of paper that is a panacea for all printing ills, but we are using a generic term for paper that is coated or filmed with a mineral and an adhesive to produce a smooth plane surface. Modifications for making it suitable for the use at hand will vary as did the uncoated papers. For four color rotary perfecting presses the pick test will be 9 to 11 wax, whereas for Vaporin and flash inks a pick test of 7 to 9.

Cost Considerations

One problem is the always important matter of cost. With the data at hand, the industry is working to produce coated paper, or its equivalent, at little or no advanced cost to the publisher and is already on its way to make this an accomplished fact. Printing is also trying to meet this problem with the commercial application of their new developments. With the renaissance of letterpress, the rotogravure process is endeavoring to meet the challenge by greater economy of operation through increased speed permitted by closed fountains and more volatile ink vehicles and by improved quality through the use of coated paper. Offset also is endeavoring to meet the strong brilliant results of the new letterpress product by the use of coated paper.

There are certain limiting factors governing the change over of any mill to machine coated papers which can be seen at present. The mill construction and layout seem to me to be most important. A large proportion of our older mill units do not permit any of the changes necessary to accommodate an added unit on their machines without either expensive rebuilding or serious curtailment of production. Personnel is the next in importance as the operations involved are entirely new to all paper makers as is the product of these operations to the major number of our book mills. While the personnel of a coating mill are familiar with the finished product, they are not trained to the size and speed of the units in large scale paper mill operation and would be no material assistance to these operations and in a safety sense might be a hazard. Cost of installation is not a serious factor as the present methods vary from $150.00 to $1000.00 per inch. The trend is downward and should stabilize at about $600.00 for efficient equipment. This is not taking into consideration the expense for accessory equipment such as coating mix departments, supercalenders, rewinders, etc.

The Coating Mix

Consideration of the properties of the coating mix such as the use of casein, starch, glue, etc. present another problem. They should be on the basis of the mechanical equipment used for application and the constants desired in the finished product. At present, the greater proportion of machine coated paper is starch coated, with casein second, and a small scattered tonnage using various gums and glue. Wherever the mechanical equipment will permit, choice of adhesives should be made on the basis of relative costs per ton of dry coating as between casein and starches. Casein, while it has some disadvantages, has, I believe, sufficient merit to warrant its use at anything like even costs and can be modified to meet any of the printing requirement demands.

The physical properties of the coating mix of necessity must vary to suit the requirements of the means used for application. There is only one cardinal rule that will apply to all processes, that rule being that the viscosity suitable for the process at hand be produced with the minimum amount of water or other vehicle, since the smaller the percentage of water in the mix the less you will have to evaporate on the paper machine.

The minerals to be used are controlled by the applying equipment and the product desired. Machine coated paper is now being produced with 100 per cent clay, 100 per cent calcium carbonate, and 100

per cent titanium dioxide; the clay and carbonate sheets being used as an English finish Magazine sheet, and the 100 per cent titanium sheet as an opaque bread wrap.

Paper furnishes vary with the type of mill doing the machine coating and cover the field from 80 per cent groundwood through the soda-sulphite free sheet group to 100 per cent sulphite. Broke and waste, if the process is successful, should be figured on the basis of uncoated paper in the same mill.

Evolution of the Process

In evaluating machine coating processes for any mill the considerations are: elasticity of present mill layout; present fiber producing and treating equipment; type of finished product possible, using present raw stock, after machine coating; possible market for product; sales ability through present organization and contacts which will aid in marketing the new product at a profit; personnel to produce a quality product economically; and necessary capital to make the installation and weather the period necessary for development and exploitation.

I have not burdened you with a description of the process with which I am most familiar as this was already very well done by Gilbert Dickerman of Consolidated Water Power and Paper Company and there is nothing for me to add thereto. In regard to the other processes now in use, I am sure you are all familiar with them and I have no first hand knowledge of them. It is my belief that the Technical Association is particularly interested in discussing basic principles that will govern the evolution of detailed processes now being formulated to meet this situation. If this rambling discourse brings out in your discussion something of value for you to take back to your mill and has given some impetus for the further advancement of machine coating it has served its purpose.

The Ortho-Krome Process of Coating Paper*

By Albert B. Hurley[1]

Abstract

A description of a coating process utilizing the printing principle to reduce glare from the paper surface.

How may conditions pertaining to every-day visual activities be improved to enable us to see without strain or fatigue? Visual activities, of individuals of all classes, of all ages, are many and varied. We know that millions, old and young, are suffering from deficient vision today. Accepted as fact, is the knowledge that our eyesight has deteriorated rapidly since the advent of the electric or artificial light. The normal vision of the human race must be conserved at any cost. Eyes, other than normal must be protected, first by proper optical aid and glasses and then conserved by conditions of light and stimulation within the limits of normal functioning.

Artificial light, improved in intensity and quality since its inception, is not yet comparable with daylight. Our eyes evolved under daylight conditions, under high intensities of light of a quality or spectral character not obtainable from the ordinary artificial light sources, which in these modern times, we must constantly employ in our daily visual activities. Organically our eyes have not changed to meet conditions of artificial illumination and the nearness of the light source. This wonderful sense organ, the eye, flexible and adaptable to almost any intensity of light of a daylight character, is now subjected, most of the time, to artificial light of relatively low intensity, lacking blue and green rays and having a preponderance of yellow and red rays. We will not say that the blue and green rays are more essential or beneficial to the eye than the yellow and red rays. We do claim, however, that a light such as average daylight, having a continuous spectrum and composed of a relative even number of waves of radiant energy, is best for the eyes and will improve vision; also, that artificial lights with a preponderance of yellow and red rays, cause eye-strain and fatigue, are harmful to the eye, and impair vision.

High intensities of even two or three thousand foot-candle brightness of a daylight character cause only normal reaction of the pupil of the eye, while low intensities of artificial illuminants with their preponderant red and yellow rays cause glare and pupillary contraction that should and can be controlled. Brightness of the retinal image is proportional to the diameter of the pupillary opening which we find is involuntarily controlled by quality, as well as by the intensity of the light. *(1)* The small-size pupil influences definition only at very high intensities. Keeping the pupil of the eye open to a diameter of three, instead of two millimeters, under low intensities, produces approximately the same increases of vision as would result from a several hundred per cent increase in illumination. *(2)*

Seeing depends upon three things, namely; the light source, the surface of the object being viewed, and the eye itself. We cannot change the natural reaction of our eyes to light, but much can be done to improve the light to which they must adapt themselves in the function of vision.

Now, what combination of light, surface and resultant reflected light is best for the eye and will cause normal functioning, without strain and fatigue at either maximum or minimum limits adopted? The optician can keep our eyes in good condition. The physicist has given us improved artificial light and is working to perfect its quality. In working towards

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Roosevelt Hotel, New York, N. Y., Feb. 20-23, 1939.

[1] Vice-President National Paper Process Co.; President, Hurley Screen Co.

better vision, consideration of the surface is equally important.

The Process

This process consists in applying a very thin coating of fine pigments simultaneously and rapidly to both sides of the paper in a manner similar to off-set printing. The coating, unlike the clay casein coating ordinarily used, is more like a water color printing ink. It is preferable, because of opacity, color, and softness, to use zinc sulphide or its lithopones as the dry pigment. A binder is necessary, but the name of the one preferred will not be disclosed at this time. Added to the mixture of pigment and binder are pure colors selected to modify and control the light reflected from the surface of the paper. A heavy coating on the paper is not desirable and every mechanical means of getting a thin continuous film on the surface is incorporated in the coating machine. To minimize the amount of coating used, only about 50 per cent of the surface of the paper is covered and the plate cylinders in the machine are etched in the manner of a half-tone to accomplish this. Furthermore, this half-tone effect is important, if not essential, to other particular features of this process. The minimum amount of coating on both sides of a ton of 45 lb. basis book paper would be approximately 80 lb. Minimum amounts, according to type and basis weight, could be as low as 40 lb. of coating per ton of paper. Paper treated by the Ortho-Krome process will be stronger and more opaque, and the surface will reflect a controlled light, without glare, causing better and easier vision.

Physical and Optical Aspects of Paper

Ordinarily, it is assumed that socalled "white papers" reflect the full hue and value of the incident light, but if a number of white papers were directly compared, a difference in hue would be easily noticed. By means of a spectrophotometer white papers and surfaces can be compared with magnesium which is supposed to reflect blue-green and red in quantities to give the sensation of pure white. Contrary to the general belief, a test shows that almost all commercial white papers reflect a greater percentage of the longer wave lengths. White papers examined by the U. S. Bureau of Standards, *Technologic Paper no. 244*, show that the average reflection of the red-green and blue was about 36-34 and 32 respectively, as compared with equal quantities reflected by magnesium. This paper describes a method of obtaining the color characteristics of white paper in terms of its capacity for diffusely reflecting red- (0.62μ) green- (0.55μ)

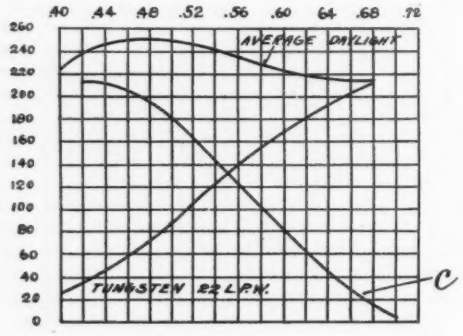

FIG. 1.

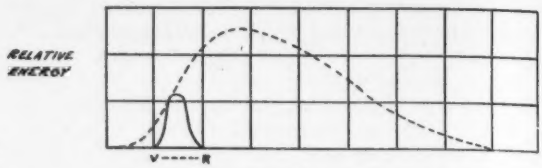

FIG. 2.

and blue- (0.46μ) and all papers were found deficient in the proportion of blue light reflected. Artificial lights radiate an abundance of red and yellow rays and are deficient in radiation of blue and green rays. The above papers viewed under artificial light as the tungsten light, would show a decided yellowish tinge, due to a preponderance of red and yellow rays in the light and to the paper's capacity for reflecting a greater percentage of the red and yellow rays.

Reading ordinarily involves the recognition of groups of characters as well as it does the discrimination of fine detail. The printed character is usually in black which is supposed to absorb all of the light or in a color giving such contrast that it has a low reflection factor. White papers of good quality finish, coated or machined, having a reflection factor of 80 to 85 per cent, show too great a contrast with the character thereon. The pupil tends to contract under the brightness of the white surface but by a fatiguing muscular action adapts its adjustment with that of the lens to give the retina an image requiring fine definition. On the retina this image of a small black character or letter is defined only because of the stimulation of the retinal receptors outlining and surrounding an area of receptors or cells not stimulated. There is in most cases a spreading of this retinal image known as "irradiation" *(3)* in which sharp definition is lost because the over-stimulation of the light area will spread to the dark area causing the black character to appear a diluted black or gray, and in some cases the appearance of high lights.

Method and Means of Application

It has been disclosed that the coating is applied to the surface in a 50 per cent half-tone effect. It will be better understood if the coating applied were looked upon as a color filter which, by nature, absorbs and reflects certain selected rays of light. The paper on which the filter is applied will, of course, reflect a percentage of unmodified light according to its character and the character of the incident light. The preferred form of the color filter is the small squares forming a checkerboard pattern, all points touching.

Any circumscribed figure could be used but none are as practicable as the square, as this form lends itself much better to uniformity of spacing and arrangement. The size and spacing are of equal importance because the pigment squares should not be visible and their dimensions are limited by the resolving power of the eye. The uniformity arranged pigment squares and the dimension of spacing would subtend to the eye a visual angle, and all small visual angles are directly proportional to the distance from the eye, that is, an object one foot from the eye is of the same visual angle as an objective twice the size at a distance of two feet. The limit of resolving power of the eye is an object so small that its image falls upon one retinal receptor, *(4)* and it has been found that a normal eye cannot readily resolve two objects nearer together than about 40 seconds of visual angle which corresponds to a separation of

about 0.0037 inch at a distance of 14 inches from the eye. *(5)*

In the specific case of white papers or surfaces to be read or viewed at the normal distance of 14 inches, a limit of coarseness of the filter or screen would be one in which the pigment squares imposed and the related exposed squares would each be about .0070 inch, subtending a visual angle of about 1 minute 45 seconds at a normal viewing or reading distance a limit of fineness for best results being a visual angle of 45 seconds which corresponds to a pigment figure .0030 inch square uniformly spaced. The advantages of applying the coating in the half-tone checkerboard pattern described are:

1. Quicker, natural drying as the coating is being absorbed by the paper in five directions.
2. Lessens the amount of coating that can be effectively used.
3. Gives a natural and desirable diffusion of all light rays.
4. Allows the use of a less diluted color mix which gives more efficiency in the absorption and reflection of color waves.
5. Acts as a grating in the diffraction of light from the two surfaces which increases the opacity.

The Color Filter

To select the pigments for the color filter applied to the surface of the paper refer to the curves plotted in Fig. 1. Note the curves of average daylight, or white light, and its even distribution of energy. *(7)* Compare this daylight curve with that of the tungsten light *(8)* which curve is plotted so that its energy value equals that of daylight at the point near the limit of visibility or at wave length 0.79μ. *(9)* Subtracting the ordinates or corresponding wave lengths of the tungsten curve from those of the daylight curve, the remainders when plotted would show curve C. This curve C is practically complementary to that of the tungsten curve and means, that if the light produced by curve C is added to the light produced by the tungsten, the total light will be of the same spectral character as average daylight. If a luminosity curve of the eye were plotted, which curve is obtained by multiplying the ordinates of the daylight and the tungsten curve by the light giving value or visibility of radiation figures, *(10)* the result would show that the area under the tungsten light is approximately one-half the area under daylight, which means that equal parts of the light from the tungsten and that of the spectral character of curve C must be used to produce white light. If the tungsten light used was of a lower efficiency than 22L.P.W. a proportionate extra amount of light given by curve C would be required.

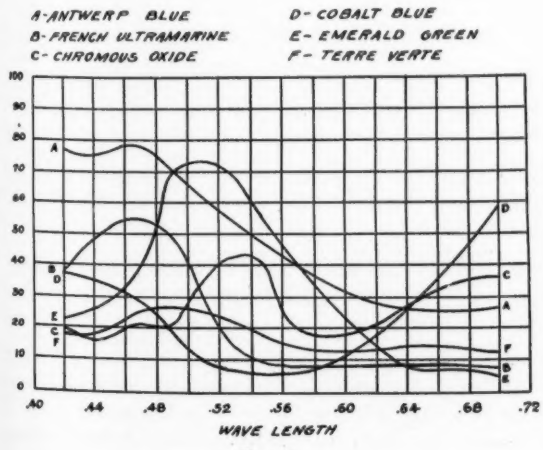

FIG. 3.

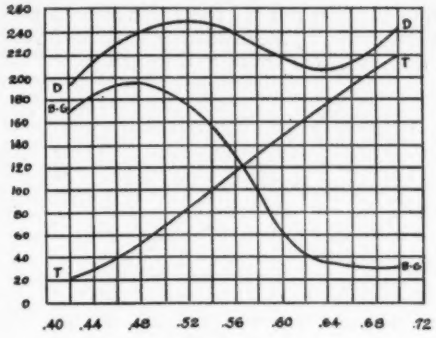

FIG. 4.

The relation between the radiation of various wave lengths and their physiologic effect in producing luminous sensation is shown in Fig. 2. *(11)* The solid curve represents the light sensation produced by the radiant energy of the tungsten light which is shown by a broken curve. The maximum light sensation is produced by rays in the middle of the visible spectrum, and gives in this case a yellow sensation. While maximum sensibility occurs at 0.55μ, with uniform energy distribution in the spectrum, the wave length of maximum luminosity for most of the artificial sources of light shifts toward the red and of the spectrum, due to the preponderance of energy of the red wave lengths. Beyond the limits of the visible spectrum, Fig. 2 shows the infra-red and ultra-violet regions in which any amount of radiant energy does not give sensation of light, but the effect of these rays on the retina of the eye may be very detrimental. *(12)* The retina of the eye receives and responds to radiation between limits of 0.35μ and 1.0μ, but the radiation easily visible and not harmful lies between 0.35μ in the violet and 0.77μ in the red. Good visibility occurs between 0.50μ and 0.60μ.

In Fig. 3 the spectral analyses of some blue and green pigments is shown by plotted curves. *(13)* Ultramarine is considered a close approach to spectral blue and is obtained from a mineral in various grades which are quite permanent. Cobalt blue is not a pure blue as it reflects a large proportion of deep red rays, but it is quite durable. Antwerp blue is an artificial pigment not as durable as the above but quite permanent if used alone. Emerald green is a carbonate of copper mixed with alumina and is a brilliant green color, fairly opaque. Chromium oxide is an opaque deep green pigment. Terre verte is a mineral found in various parts of Europe that is opaque and durable.

The chemistry of pigments is complex and many hues may be produced by mixing because pigment colors are not of spectral purity. In the present case owing to the scarcity of pure blue and green pigments (see Fig. 3) it may be impossible to exactly duplicate the spectral character of curve C, Fig. 1, but we can obtain satisfactory results if we sacrifice the transmission of some long waves and the absorption of some short waves.

A curve similar to C is plotted in Fig. 4, not to show a method of pigment mixture, but simply to explain this procedure. This curve B-G of a pigment to be used on the white surface mentioned in a manner heretofore explained, may be called blue-green, the curve is plotted with the curve of tungsten light (22 L.P.W.) which light falls upon it, and is in part absorbed and reflected while a relative amount

of white surface reflects the full value of the tungsten light. Adding the ordinates of the corresponding wave lengths of the curve B-G to that of the curve of the tungsten light the resultant as shown by curve D is comparable with the daylight curve in Fig. 2 and shows that the total light reflected from a unit of surface approximates white light. If the supposed white surface exposed did not reflect the full hue and value of the incident light the total reflection could be corrected and controlled by the pigment mixture. In this case, and instead of a curve for white which is assumed to be parallel to the base line in Fig. 1 & 4, we would plot a curve of spectral energy distribution of the particular surface and add the ordinates of B-G and the tungsten curve.

Following the procedure mentioned, a unit of treated surface, enlarged, would appear, as shown in Fig. 5, in which A represents the white surface exposed and reflecting full value of the tungsten light and B represents the pigment absorbing part and reflecting part of this light. In practice this unit would not be visible to the naked eye, but from the illuminant T the eye would receive a composite of the two reflected rays C and D. The process is more simply shown by resolving into figures the relative radiant energy of corresponding wave lengths of the curve in Fig. 4. These values are given and the light from the tungsten falls first on the unit of surface A-B, then A reflects the full value as shown in C, and B reflects the values as shown in D, and the average of the two in the spectral character of the light reflected to the eye, which approximates white light. The eye will not register the separate units of light and shade but reacts to a uniformly distributed illumination or stimulation.

It must be noted that we have not added blue and green rays to the artificial light. Simply stated, we have made these particular rays more effective and stimulating by reducing the glare and over-intensity caused by a relative greater percentage of red and yellow rays.

Blue-green pigments are very satisfactory in this case because of the Purkyne effect *(14)* which shows that they are of relatively greater brightness under low illumination than under high, making the process more effective under artificial light. Furthermore, the squares of pigments lower the reflection factor of the background and at the same time by reason of their uniform shape and spacing, they diffuse the light to reduce glare. The pigment deposited on the surface will have a reflection factor of about 45 per cent which can be varied by percentage of whites mixed, and if the surface has a reflection factor of 85 per cent the total reflection factor of the entire surface would be lowered to an average of about 65 per cent.

Visual Results

The total light reflected to the eye from this treated surface, and the mental impression received is as follows. Under ordinary daylight illumination indoors the surface appears very faintly tinted, but with a "depth" or "life" which makes the characters borne thereon assume very sharp definition. Under daylight the advantage of the treated surface lies in the reflection of glare and the lowering of the reflection factor to secure better contrast of background and character thereon. Exposed to artificial light as a nearby tungsten light, the impression of color vanishes and the mental impression is that of a pure white surface. The effect can be confirmed by holding the treated surface under test in a fixed position under high illumination and moving a perfectly white or the same untreated surface towards it. The eye at once responds to the higher stimulus, due to the increased intensity, and the mental impression of color or shade is produced by comparison with respect to the white or untreated surface. As the white surface moves away all impression of color vanishes from the treated surface and within a period of time varying with the degree of over stimulation the mental impression is again that of a pure white surface.

Light reflected from the treated surface will normally and evenly stimulate the rod and cone cells by a predetermined period of vibration which will result in a normal reaction of nerves without strain. It will prevent the over stimulation of the retina which causes the sensation to "over-shoot"; *(15)* lessen the effect of after images and the possibility of mistaking a printed character, letter or figure. Because of the percentage difference in stimulation of the retina the growth and decay *(16)* of color sensations is helped, which saves a period between the time of first perception and that of final conception.

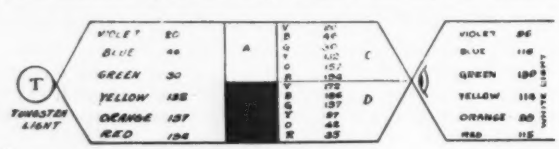

FIG. 5.

The Finished Product

Regarding the types of paper that can be processed as outlined herein, it is not practical as a whole to use the finished papers now supplied to the consumer. It is desirable and best that a special sheet be made for this process, and then finished according to the specifications and requirements of the consumer. If a consumer is now using a 50-lb. white book, and has selected that weight as a minimum for strength and opacity, it is entirely possible to give him a 45-lb. paper of greater strength and greater opacity by a sacrifice to color. This special paper can then be processed to a more desirable color than the original 50-lb. sheet used, with added opacity because of the pigment in the color filter applied to the two surfaces of the sheet. In this way a processed sheet may be an economical factor to both paper manufacturer and consumer.

This process applied to news grade enhances the appearance to a remarkable degree with the added advantage of prolonging the life of the surface. It has been found that the coating used retards the oxidation of news grade papers. This feature is proven by laboratory samples and by samples of processed and unprocessed paper printed in small editions of the New York Times and the Mt. Vernon Argus in 1932.

(1) John T. Walsh, Photometry: 1926, p. 52-55.
(2) M. Luckeish, Light and Work: 1924, p. 126. John T. Walsh. Photometry: 1926, p. 55.
(3) John T. Walsh, Photometry: 1926, p. 70. M. Luckeish, Color and Its Application: 1921, p. 179.
(4) John T. Walsh, Photometry: 1926, p. 51-52.
(5) M. Luckeish, Light and Work: 1924, p. 136.
(6) Robt. W. Ward, Physical Optics: 1923, p. 211.
(7) H. E. Ives, I. E. S., Vol. 5, p. 189.
(8) Wm. E. Barrows, Light, Photometry, and Illuminating Engineering: 1925, p. 46.
(9) M. Luckeish, Color and Its Application: 1921, p. 236.
(10) John T. Walsh, Photometry: 1926, p. 65.
(11-12-13) M. Luckeish, Color and Its Application: 1921, p. 8, p. 298, and p. 351.
(14-15-16) John T. Walsh, Photometry: 1926, p. 72, p. 70, and p. 137.

Review Of Paper Industry Literature

Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C., for 10 cents each. Send currency, not stamps.

Paper Specialties

Moldable Articles. The Mead Corporation. Brit. pat. 482,894 (April 6, 1938).—Boards, etc., are produced by mixing intimately, with agitation, fibrous material in water with finely-divided lignin-derivative material obtained from digestion liquor used in the production of paper pulp, flowing the mixture, containing, e.g., 97 per cent of water, onto a former and withdrawing water, e.g., by suction, to form a sheet or other article which is pressed to desired form and thickness and dried at below the fixing temperature of the lignin-derivative material. Finely-divided substantially-pure ash-free lignin residues are obtained from sulphite, sulphate, soda or other digestion process of woody materials, e.g., by precipitation by an acid such as carbon dioxide, in the case of a black liquor from soda pulp manufacture. The fibrous material may be cotton linters, alpha-cellulose, groundwood, asbestos or pyrophillite. The lignin residues are precipitated at a pH of 7.8 to 9.0 and the suspension is heated to about 60 deg. C. to coagulate the particles, cooled, filtered, washed, treated with excess acid (such as sulphuric) and again washed. The dried material may be granulated. It may be used with phenol-formaldehyde or urea-formaldehyde resins, pigments (such as carbon, Nubian black, dyes, etc.), alum, etc., being added during or after beating. Size may be added to the pulp in the usual way. The boards, etc., are dried at low temperature, compressed at, say 10,000 lb. per sq. in., and molded at 310 deg. to 350 deg. F. Furfural may be added to control the fusing point of the lignin derivative.—A.P.-C.

Stereotype Mats. Harry J. Hosking and Alexander Bradie, Hosking assignor to Foster D. Snell, Inc. U. S. pat. 2,112,023 (March 22, 1938).—A sheet of cellulose material is conditioned to the proper moisture content for reception of a coating mixture, the coating mixture (e.g., a glue-urea mixture) is applied, the mat is calendered to the desired hardness and thickness, and it is then passed through a conditioning liquid, such as a tanning solution of formaldehyde. (Cl. 91-68).—A.P.-C.

Laminated Pressed Wallboard. John H. Mckenzie, assignor to Marbon Corporation. U. S. pat. 2,125,847 (Aug. 2, 1938).—The product comprises a ply of steam-exploded type of wood fiber (such as masonite) to which is securely bonded a ply of stabilized rubber hydrochloride with or without the addition of fillers. (Cl. 154-45.9). —A.P.-C.

Board and Process of Making the Same. George H. Ellis, assignor to the Insulite Company. U. S. pat. 2,134,659 (Oct. 25, 1938).—A continuously formed fibrous sheet is pressed under 10,000 to 50,000 lb. per foot of width by means of rolls 40 in. to 60 in. in diameter heated to from 300 to 700 deg. F. A suitable "tempering" agent (such as gloss oil) is preferably applied by means of a pair of rolls, and is then distributed evenly and forced into the body of the sheet by means of heated rolls. The sheet is humidified to the desired moisture content, cooled, slit and cut transversely into sheets of the desired dimensions. (Cl. 92-21). —A.P.-C.

Duplex Single Facer. Henry B. Greenwood, assignor to F. X. Hooper Company, Inc. U. S. pat. 2,106,500 (Jan 25, 1938).—The invention provides a machine that can make board with either large or small corrugations, that will operate on a single level, and that will occupy approximately the same floor space as a single ordinary corrugating machine. Various mechanical features of design are covered. (Cl. 154-31).—A.P.-C.

Process and Apparatus for Drying Fiberboard. Wm. H. Mason, assignor to Masonite Corporation. U. S. pat. 2,122,376 (June 28, 1938).—A moist fiber sheet which is formed continuously is traveled continuously through a drier while kept continuously under pressure. Preliminary application of pressure is higher than that continuously applied throughout the drying operation, so that water which is brought to the surface by the high pressure, but not driven off, is reabsorbed upon the pressure being reduced, thereby avoiding production of "water spots". As the sheet travels through the drier, it is accompanied by a wire fabric, which facilitates the egress of the moisture from the sheet. (Cl. 34-12).—A.P.-C.

Process of Making Hardboard Lignocellulose Fiber Products. Wm. H. Mason, assignor to Masonite Corporation. U. S. pat. 2,120,137 (June 7, 1938).—In making a hardboard product having high dry- and wet-strength from a light porous sheet of lignocellulose fiber containing the natural fiber incrustants, the sheet is dried to a bone-dry condition, and then subjected to pressure at a temperature of about 205 to 260 deg. C. materially to consolidate and densify and impart high dry-and-wet strength to the material by activation of the bonding properties of the incrusting substances. (Cl. 92-39).—A.P.-C.

Burnishing Fiberboards. Wm. H. Mason, assignor to Masonite Corporation. U. S. pat. 2,118,763 (May 24, 1938).—Fiberboards of lignocellulosic material are made to travel in one direction and are subjected to the action of a pair of opposed, smooth surfaced and highly heated rolls which revolve at high speed in a direction opposite to the travel of the boards. (Cl. 92-68). —A.P.-C.

Leatherboard. Herman W. Richter assignor to George O. Jenkins Company. U. S. pat. 2,128,965 (Sept. 6, 1938).—By treating leatherboard with solutions of phosphoric acids (such as orthophosphoric, pyrophosphoric and metaphosphoric) the dark color of iron-tannate inks may be removed as effectively as and more cheaply than by the oxalic acid treatment disclosed in Richter's U. S. pat. 1,975,556. (Cl. 8-2).—A.P.-C.

Forming Articles Such As Milk Bottle Caps from Sheet Cellulosic Material. James R. Morris, assignor to Geo. J. Lincoln, Jr. U. S. pat. 2,123,-543 (July 12, 1938).—Blanks cut from cellulosic

material are impregnated with wax, then enveloped in a humid atmosphere until a uniform dampness is produced throughout the fibers of the blanks, and they are die-pressed and shaped by high pressure. (Cl. 18-56).—A.P.-C.

Paper Milk-Bottle Cap. Kempton Clark, assignor to American Seal-Kap Corporation of Delaware. U. S. pat. 2,121,951 (June 28, 1938).—An uncolored, relatively slow, paper stock is used for contact with the bottle contents, with an outer layer of a colored paper stock freer than the uncolored inner stock. (Cl. 215-38).—A.P.-C.

Surfaced Felted Fibrous Material. Truman A. Pascoe and Roy P. Hella, assignors to Cellovis, Inc. U. S. pat. 2,124,330 (July 19, 1938).—Paper is formed of a furnish comprising slow stock and finely divided cellulose derivative. The sheet is dried and moist calendered with heated rolls so that the cellulose derivative is coalesced at least at the surface of the sheet to provide a smooth surface. A coating of cellulose derivative dissolved in a volatile solvent is applied to the surface of the sheet and the solvent is evaporated. (Cl. 92-21).—A.P.-C.

Method of Making Thick-Walled Vulcanized-Fiber Tubes. Harry C. Hackett, assignor to National Vulcanized Fibre Company. U. S. pat. 2,133,137 (Oct. 11, 1938).—A relatively thin-walled tube is formed by chemically treating a strip of paper with a gelatinizing agent, winding on a mandrel to the desired thickness, puring, drying and rolling. This tube is then used as a mandrel on which are wound additional layers of similarly treated paper up to the required thickness, and the tube is pured, dried and rolled in the usual manner. (Cl. 154-2).—A.P.-C.

Apparatus for Forming Pulp Articles. Ernest Hoff and Andrew Keiding, assignors to American Lace Paper Company. U. S. pat. 2,128,745 (Aug. 30, 1938).—The invention provides an apparatus for carrying out the process disclosed in Huff and Keiding's U. S. pat. 2,023,200, of Dec. 3, 1935, and deals with numerous mechanical features. (Cl. 92-54).—A.P.-C.

Composite Roof Panel or Shingle. Armin Elmendorf. U. S. pat. 2,130,178, (Sept. 13, 1938).—The invention consists in forming what may be regarded as very wide shingles constructed in two sections, the lower one of wood and the upper one of felt or other suitable flexible material, preferably saturated with asphalt. The two sections of each shingle are preferably of the same length and overlap each other somewhat (usually about 2 inches). When laid in the usual manner for ordinary shingles, there is produced a covering of double thickness, one of wood and the other of felt. (Cl. 108-8).—A.P.-C.

Process of Manufacturing Noninflammable Articles of Organic Fibrous Materials. Bernhard Müller, assignor to Rutgerswerke-Aktiengesellschaft. U. S. pat. 2,128,782 (Aug. 30, 1938).—Fibrous material such as a mixture of straw and wood pulp is treated in the beater with ammonia, soluble phosphates and soluble silicofluorides (preferably magnesium silicofluoride), which react to precipitate difficultly soluble phosphates and silicic acid on the fibers, and the latter are made into plates, slabs, etc., in the usual way. (Cl. 92-21).—A.P.-C.

High-Temperature Roofing Saturating or Coating Apparatus. Harry A. Cumfer. U. S. pat. 2,126,872, (Aug. 16, 1938).—The cost of saturating and coating units is considerably decreased by: (1) reducing the number of loops in the saturating vat by providing long upward loops which make unnecessary some of the loops formerly extending downwardly into the saturating vat, and (2) dispensing with steam boiler equipment and using hot molten asphalt for heating the various squeeze rolls. (Cl. 91-46).—A.P.-C.

Laminated Material Suitable for Absorbing Vibrations. John D. Cochrane, Jr., assignor to The Formica Insulation Company. U. S. pat. 2,118,549, (May 24, 1938).—To a foundation body such as one of laminated paper there is applied a surface-sheet coated on its outer side with a dried pigmented resin varnish and on its inner side with a dried resin varnish of different type adapted to serve as a bonding agent, and the assembled materials are consolidated under heat and pressure. (Cl. 154-2).—A.P.-C.

Apparatus for Surfacing Roofing. Benjamin S. Penley, assignor to the Barrett Company. U. S. pat. 2,133,473 (Oct. 18, 1938).—Two or more sets of spaced wavy streams of granular surfacing material are fed on to a travelling sheet of roofing without feeding the granular material through openings or orifices which are likely to become clogged. The streams are applied in different planes longitudinally of the sheet, with the individual streams of one set staggered widthwise of the sheet with respect to those of the other set. A novel, nonclogging distributor roll is provided in the hopper from which the granular surfacing is supplied to the sheet. (Cl. 91-43).—A.P.-C.

Laminated Structure. Herbert J. Woodall and Meredith S. Randall, assignors to Woodall Industries, Inc. U. S. pat. 2,134,495 (Oct. 25, 1938).—A sound deadening panel comprises a basic ply consisting of a metal sheet, to which is firmly cemented a sound-deadening ply consisting, preferably, of "KB" board in which are formed numerous openings or apertures. There may also be provided a heat-insulating ply (suitably of Masonite) which also has numerous apertures. (Cl. 154-44).—A.P.-C.

Surfaced Roofing. Frank P. Reynolds, asnignor to Bird & Son, Inc., U. S. pat. 2,128,191 (Aug. 23, 1938).—Oil-treated granules are applied to asphalt impregnated and coated roofing, and there is applied to the roofing a water-starch solution (e.g., 10 lb. of starch to 100 lb. of water) at the rate of 25 to 40 lb. per ton of granules. This prevents falling out of the granules during handling, storage and laying of the roofing; and the protective coating is rapidly eliminated by rain, etc., after laying. (Cl. 91-68).—A.P.-C.

Method of and Machine for Producing Coated Roofing. Ralph W. B. Reade, assignor to United States Gypsum Company. U. S. pats. 2,128,190 and 2,128,214 (Aug. 23, 1938).—In the manufacture of so-called corrugated surface roofing material having a leather-like grain or a socalled grapevine finish, the coating rolls are operated at a peripheral speed greater than the speed of the sheet; and the grain or surface effect may be varied within desired limits by varying the amount of excess speed of the rolls. *No. 2,128,190* covers the machine and *no. 2,128,214* the process. (Cl. 91-31; 91-68).—A.P.-C.

Imports of Paper and Paper Stock

Giving Manifests of New York, Boston, Philadelphia and Other Ports of Newsprint, Wrapping, Writing, Coated, Blotting, Tissue, Strawboard, Wallboard, Cigarette Papers, Sulphite, Kraft and Ground Wood Pulp.

NEW YORK IMPORTS

WEEK ENDING OCTOBER 14, 1939

SUMMARY

Cigarette paper.....127 cs.
Newsprint.....4,070 rolls
Wrapping paper.....5 rolls
Receipt paper.....216 rolls
Tissue paper.....198 bbls.
Miscellaneous paper.....155 cs.

CIGARETTE PAPER

Jay Madden Corp., *Mathilda Thorden,* Kotka, 127 cs.

NEWSPRINT

Jay Madden Corp., *Greta Thorden,* Kotka, 1,198 rolls.
National Pulp & Paper Co., *Oslofjord,* Oslo, 685 rolls.
Jay Madden Corp., *Mathilda Thorden,* Kotka, 1,728 rolls.
H. Reeve Angel & Co., Inc., *Mathilda Thorden,* Kotka, 459 rolls.

WRAPPING PAPER

Dingelstedt & Co., *Jean Jadot,* Antwerp, 5 rolls.

RECEIPT PAPER

National Cash Register Co., *Scanpenn,* Copenhagen, 216 rolls.

TISSUE PAPER

Jay Madden Corp., *Mathilda Thorden,* Helsingfors, 198 bbls.

MISCELLANEOUS PAPER

——, *Yamazuki Maru,* Kobe, 155 cs.

RAGS, BAGGINGS, ETC.

W. Steck & Co., *Augvald,* Buenos Ayres, 292 bls. rags.

WOOD PULP

Gottesman & Co., Inc., *Express,* Constanza, 1,000 bls. bleached sulphite, 200 tons.
M. Sone, *Express,* Constanza, 375 bls. bleached sulphite, 75 tons.
Guaranty Trust Co., *Kentucky,* Gothenburg, 7,415 bls. dry sulphate.
Pulp Sales Corp., *Hjelmaren,* Kemi, 8,350 bls. sulphite.
D. M. Hicks, Inc., *Jean Jadot,* Antwerp, 108 bls. wood pulp.
J. Anderson & Co., *Oslofjord,* Sarpsborg, 600 bls. dry bleached sulphite.
The Borregaard Co., Inc., *Oslofjord,* Sarpsborg, 300 bls. unbleached sulphite.
E. M. Sergeant Pulp & Chemical Co., *Oslofjord,* Nygard, 500 bls. dry bleached sulphite.
Bank of N. Y. Trust Co., *Tennessee,* Hernosand, 1,236 bls. wood pulp, 150 bls. sulphite.
Bank of The Manhattan Co., *Tennessee,* Hernosand, 150 bls. sulphate.
Parsons & Whittemore, Inc., *Aragon,* Oslo, 1,000 bls. dry bleached sulphite.
J. Andersen & Co., *Aragon,* Greaker, 2,000 bls. wet sulphite.

ALBANY IMPORTS

WEEK ENDING OCTOBER 14, 1939

Perkins Goodwin & Co., *Tennessee* Hernosand, 300 bls. sulphite.
Bank of The Manhattan Co., *Tennessee,* Hernosand, 3,000 bls. sulphite, 750 bls. sulphate.
Bank of N. Y. Trust Co., *Tennessee,* Hernosand, 3,630 bls. sulphite.
Pulp Sales Corp., *Mathilda Thorden,* Viipuri, 2,720 bls. sulphite, 669 bls. sulphate.
Pulp Sales Corp., *Mathilda Thorden,* Kotka, 169 bls. bleached sulphite, 1,375 bls. bleached sulphate.

PORTLAND IMPORTS

WEEK ENDING OCTOBER 14, 1939

Pagel Horton & Co., Inc., *Hallfried,* Sweden, 3,060 bls. wood pulp.

BOSTON IMPORTS

WEEK ENDING OCTOBER 14, 1939

——, *American Importer,* Liverpool, 27 pkgs. paper stock, 382 bags hidecuttings.

PHILADELPHIA IMPORTS

WEEK ENDING OCTOBER 14, 1939

Price & Pierce, Ltd., *Donald McKay,* ——, 300 bls. unbleached sulphite.
Pagel Horton & Co., Inc., *Toledo,* Norway, 1,279 rolls newsprint.
English China Clays Sales Corp., *Nidarholm,* Fowey, 32 casks, 4,028 bags, 867 tons china clay.
Moore & Munger, *Nidarholm,* Fowey, 630 tons china clay.

WILMINGTON IMPORTS

WEEK ENDING OCTOBER 14, 1939

Bank of The Manhattan Co., *Tennessee,* Hernosand, 1,200 bls. wood pulp.
French American Banking Corp., *Tennessee,* Hernosand, 1,500 bls. sulphite.
Bank of N. Y. Trust Co., *Tennessee,* Hernosand, 1,500 bls. sulphite.

BALTIMORE IMPORTS

WEEK ENDING OCTOBER 14, 1939

Bank of N. Y. Trust Co., *Tennessee,* Hernosand, 3,300 bls. wood pulp, 1,800 bls. sulphite.
Bank of The Manhattan Co., *Tennessee,* Hernosand, 210 bls. sulphite.
French American Banking Corp., *Tennessee,* Hernosand, 210 bls. sulphite.
Bulkley Dunton Pulp Co., Inc., *Tennessee,* ——, 600 bls. wood pulp.

NORFOLK IMPORTS

WEEK ENDING OCTOBER 14, 1939

Pulp Sales Corp., *Greta Thorden,* Kotka, 1,930 bls. sulphite, 2,760 bls. sulphate, 156 bls. bleached sulphate.
H. Reeve Angel & Co., Inc., *Greta Thorden,* Kotka, 355 rolls newsprint.
Old Dominion Paper Co., *Greta Thorden,* Kotka, 155 rolls newsprint.

NEWPORT NEWS IMPORTS

WEEK ENDING OCTOBER 14, 1939

Bank of The Manhattan Co., *Tennessee,* Hernosand, 210 bls. wood pulp.

New Clay Sources

The modern plant of the Thomas Alabama Kaolin Company, located at Hackleburg, Ala., is now in operation. This new plant is producing a very pure Kaolin of extremely fine particle size, which is especially adapted as a filler clay for the paper industry. The main office of the Thomas Alabama Kaolin Company is in Baltimore, Md. C. P. Robinson, 420 Lexington avenue, New York, is special sales representative.

Trade Association Changes Meeting Date

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., October 16, 1939—J. R. Howarth, president of The Philadelphia Paper and Cordage Association, has sent out letters to all the Association members notifying them of the change in the meeting place for future meetings of the Association. Heretofore it has been customary over the years, for the Association to hold its meetings at the Adelphia Hotel on the third Friday of each month. However, the October meeting of the Association will be held at 12:30 on Friday, October 20th, at Ben Franklin Hotel.

The membership in the Philadelphia Paper and Cordage Association includes American Lace Paper Company, American Writing Paper Corporation, The Albemarle Paper Manufacturing Company, Acme Specialty Sales Company, American Forest Products Company, Aatell & Jones, Inc., The American Paper Goods Company, Allied Paper Mills, Badger Paper Mills, Buffalo Envelope Company, Frederick I. Brower (Atlantic Gummed Paper Corporation), Cecil Bentley, The Champion Paper and Fibre Company, The Denney Tag Company, Diamond Paper and Box Company, Dixie-Vortex Co., Wm. V. Edkins, The Edwin H. Fitler Company, Leonard Fitzgerald (Sales Representative for Schmidt & Ault Paper Company, York, Pa., and Hummel-Ross Fibre Corporation, Hopewell, Va., Fort Howard Paper Company, J. E. Fricke Company, Carroll T. Gardner (Mill Representative for Henle Wax Paper Manufacturing Company, Bronx, N. Y. C., Groveton Paper Company, Inc., Groveton, N. H., and The Little Falls Paper Company, Newburgh, N. Y.), Garrett-Buchanan Company, H. M. Gifford Manufacturing Company, The Glassine Paper Company, Lee Johnson (Sales Representative for The Gummed Products Company, Troy, Ohio), W. C. Hamilton & Sons, Missouri Corporation, The Hinde & Dauch Paper Company, F. W. Hoffman & Company, Inc. Hollingsworth & Whitney Company, Hooper Paper & Twine Company, Inc., J. R. Howarth Paper Company, Inc., Huff Paper Company, Paper City Manufacturing Company, Inc., Krout & Fite Manufacturing Company, E. K. Lay Company, Lily Cup & Specialties Company, The Little Falls Paper Company, Inc., The J. P. Lewis Company, Matthias Paper Corporation, C. Moore & Company, Inc., National Waterproofing Co., Oval Wood Dish Corporation, Progressive Paper Company, Paper Manufacturers Company, Inc., Paper Merchants, Inc., Penn Paper and Stock Company, Quaker City Paper Company, Otto W. Renner, Raymond & McNutt Company, Philip Rudolph & Son, Inc., St. Regis Paper Company, Sanitary Products Corporation of America, Schuylkill Paper Company, Arthur B. Sherrill (Representative for American Wood Board Company, D. M. Bare Company, Hawthorne Paper Company, and American Wood Board Company), Shryock Brothers, E. J. Spangler Company, Stark Paper & Twine Company, Terminal Paper Company, Union Envelope Company, Walden, Sons & Mott, Inc., Whiting-Patterson Company, Inc., Whiting-Plover Paper Company, Wheeler Paper Corporation, Frank W. Winne & Son, Inc., D. L. Ward Company, and Wolf Brothers.

Salesmen Discuss Problems

Members of the Eastern Division of the Salesmen's Association of the Paper Industry, E. A. Merchant, secretary, 122 East 42nd street, New York, at the regular Monday luncheon held at Harvey's Restaurant on October 16, participated in a discussion of sales problems arising from the flood of orders received by mills since September 1. Some mills have withdrawn prices, others have apportioned output among their customers and others are operating on Sunday. It was estimated that an average operation for the industry of 83 per cent would take care of actual consumption, and another 5 per cent would build stocks up to normal. Production in excess of 88 per cent of capacity, therefore, represents tonnage that is not needed.

The Bowling Party of the Association will be held on Thursday, October 19 at one of the Tudor City restaurants and the 42nd street and Second avenue bowling alleys, with a match between the 41 Park row boys and the 42nd street members.

A. S. Cosler Leaves Bauer Bros.

Arthur S. Cosler, 725 N. Limestone street, Springfield, Ohio, announces the severance of his connection with the Bauer Brothers Company. Mr. Cosler states that his plans for the immediate future are to develop some of his refiner ideas and work in the field of paper stock preparation, high yield semi-chemical pulp preparation and rejects refining.

Paper Stock Prices More Stable

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., October 16, 1939—For some weeks past there have existed two sets of prices on paper stock, one that was considered official, and the other set up by outsiders coming in and offering premiums. However, the prices are now more stable and current market prices are holding strong with conditions very much settled down to normalcy.

Empire State TAPPI to Meet

The Empire State Section of the Technical Association of the Pulp and Paper Industry will meet at the Hotel Woodruff, Watertown, N. Y., Saturday, November 4th at 2 P.M. There will be a technical program in the afternoon, followed by a dinner program at 7 P.M.

Unity Paper Mill May Reopen

A report from Potsdam, N. Y., states that it is reported on reliable authority that the Unity Paper Mill, Depot street, which was shut down four years ago, may be reopened within the next few weeks. Men have been put to work cleaning the mill machinery and clearing out the debris.

Ground Wood Mill for Brazil

Frank P. Lyden, dealer in used and rebuilt paper mill machinery, Newark, N. J., reports that he has just sold to a company in Brazil practically a complete ground wood mill.

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, October 18, 1939.

Following the buying spurt which began with the declaration of hostilities against Germany by England and France last month, a period of more normal business activity is now reported in the paper and pulp trade. The volume of business booked continues to be reported in excess of production, with practically all mills operating at capacity. It has been pointed out in some quarters of the trade that caution should be observed whenever the production ratio of mills exceeds 88 per cent of capacity, as this figure represents an output adequate for normal domestic needs.

The index of general business activity advanced to 102.7 per cent for the week ended October 7, from 102.1 per cent for the preceding week, compared with 84.9 per cent for the corresponding week in 1938. Production of 132 reporting paper mills for the week ended October 7 was estimated at 92.6 per cent, compared with 81.6 per cent for the like week last year, and with 77.0 per cent for corresponding the week in 1937. Paper board production for the week ended October 7 was 84.0 per cent, compared with 70.0 per cent for the like period last year, and with 67.0 per cent for the corresponding week in 1937.

No important change in the newsprint market has been reported this week. Domestic production for August 1939 was 80,000 tons, compared with 75,855 tons for the same month last year. Stocks on hand at the end of the August period totaled 17,946 tons, compared with 18,583 tons for the like period last year.

Production of all grades of paper continues at a very high level and the backlog of orders is, in many cases, reported two months ahead of capacity production. Some concern has been expressed in the industry that, if the termination of hostilities should come at an unexpectedly early date, a sharp drop in demand likely to follow this event would result in a substantial volume of cancelled orders. Prices of all grades of paper are firm and unchanged at this date with no further upward revision in mill prices expected in the trade this month.

Mechanical Pulp

No important change has been reported in mechanical pulp this week. Domestic production of mechanical pulp for August 1939 totaled 76,461 tons; total stocks on hand, 33,839 tons.

Chemical Pulp

No important change in prices or demand has been reported in chemical pulp this week. Prices are firm, with shipments coming through from all Scandinavian countries, with Finland experienced the most difficulty in maintaining its overseas trade in wood pulp. Uncertainty prevails, of course, in the foreign pulp trade, and no tendency is indicated to raise prices or to increase production unduly by mills abroad above normal requirements.

Domestic production of bleached sulphite pulp for August 1939 totaled 93,281 tons, of which 56,345 tons was used in paper. Production of unbleached sulphite for the same month totaled 55,810 tons, of which 36,110 tons were converted into paper. Domestic production of unbleached sulphate pulp for the like month was 194,898 tons, of which 194,676 tons was used in the manufacture of kraft paper and paper products.

Old Rope and Bagging

Trading in old rope is reported as active and prices very firm. Domestic Manila rope is currently quoted at from 3.00 to 3.50. Trading in old bagging is less active and prices are unstable. Domestic No. 1 gunny is currently quoted at from 1.75 to 2.00 and bright baging at from 1.75 to 1.90.

Rags

The rag market is reported as less active for the current week. No important changes were reported, except on No. 2 roofing rags, which are currently quoted at from 1.30 to 1.40. Mill buying of roofing rags is reported as cautious.

Old Waste Paper

Prices are very firm on many grades of old waste paper with many upward revisions in prices, except on No. 1 mixed paper which remain unchanged. White envelope cutting are currently quoted at 2.75 to 3.00; hard white No. 1, at from 2.25 to 2.50, and soft white No. 1, at from 1.70 to 1.80. Old corrugated is a little lower and currently quoted at from .65 to .75.

Twine

No important change in the twine market has been reported this week. Prices remain firm on all grades of hard and soft fiber twines.

Jonathan Bulkley Dead

Jonathan Bulkley, senior partner of Bulkley, Dunton & Co., 295 Madison Avenue, paper dealers, died at his country home at Ridgefield, Conn., Tuesday, of pneumonia in his eighty-third year. His New York residence was 600 Park Avenue.

Mr. Bulkley was a director of the Oxford, Rye-gate and St. Regis paper companies, and of the Home Life Insurance Company and the Massachusetts Corporation. A graduate of Harvard, class of 1879, Mr. Bulkley belonged to the University, Downtown, and Metropolitan clubs.

Surviving are his widow, the former Sarah L. Tod; two sons, Jonathan Ogden and David Tod Bulkley, and a daughter, Mrs. Francis F. Randolph, all of New York.

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, October 18, 1939.

BLANC FIXE—Prices on blanc fixe are firm under a good demand. Prices continue unchanged for the current week. The pulp is currently quoted at from $42.50 to $45 per ton, in bulk; the powder is offered at from 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER—Quotations on bleaching powder are firm under an active demand, with no change in market quotations reported this week. Bleaching powder is currently quoted at from $2 to $2.85 per 100 pounds, in drums, at works.

CASEIN—The demand for casein is reported as active, with prices firm and unchanged for the current week. Standard domestic casein, 20-30 mesh, is currently quoted at 20 cents per pound; 80-100 mesh, at 20½ cents per pound; all prices in bags, car lot quantities.

CAUSTIC SODA—Quotations on caustic soda are firm under a good demand. No change from prevailing prices have been reported. Solid caustic soda is currently quoted at from $2.30 to $2.40 per 100 pounds; flake and ground at from $2.70 to $2.95 per 100 pounds, in drums, at works.

CHINA CLAY—Quotations on china clay are firm under good demand. Prices continue unchanged at prevailing market levels. Domestic filler clay is currently quoted at from $7 to $15 per ton; coating clay at from $11 to $22 per ton, at mines. Imported clay is quoted at from $13 to $25 per ton, ship side.

CHLORINE—Quotations on chlorine are firm and conform to prevailing market prices. Chlorine is currently quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b., works.

ROSIN—The rosin market is reported as firm with only small changes in prices on some grades. "G" gum rosin is currently quoted at $5.40 per 280 pounds, gross weight, in barrels, at Savannah. "FF" wood rosin is quoted at $5.30 per 280 pounds, gross weight, in barrels, New York. Seventy per cent gum rosin size is offered at $2.87 per 100 pounds, f.o.b., shipping point.

SALT CAKE—Prices on salt cake are firm under an active demand, with prices unchanged for the week. Current quotations on salt cake range at from $15 to $19 per ton; chrome salt cake at from $14 to $15 per ton, f.o.b., shipping point. Prices on imported salt cake are nominal.

SODA ASH—Quotations on soda ash are firm under a good demand. Current quotations on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in bags, $1.10; and in barrels, $1.35.

STARCH—Quotations on corn starch are reported firm under a good demand with prices only slightly lower for the week. Globe pearl is currently quoted at $2.55 per 100 pounds; special paper starch at $2.65 per 100 pounds. All prices in bags, f.o.b., Chicago.

SULPHATE OF ALUMINA—Prices on sulphate of alumina are firm and unchanged at prevailing market quotations. The commercial grades are currently quoted at $1.15 per 100 pounds; iron free at $1.30 per 100 pounds, in bags, car lot quantities, f.o.b., works.

SULPHUR—Quotations on sulphur are firm under a good demand and unchanged at prevailing market levels. Annual contracts are currently quoted at $16 per long ton, f.o.b., mines. Spot and nearby car lots are offered at $19 per ton.

TALC—Prices on talc are firm under a good demand and unchanged at prevailing market quotations. Domestic talc is currently quoted at from $15 to $18 per ton, Eastern mines. Prices on imported talc are nominal.

Market Quotations

Paper

(Delivered New York)

News, per ton—			
Roll, contract	$50.00	@	—
Sheets	58.00	@	—
Kraft—per cwt.—Delivered Zone A			
No. 1 Northern	$4.75	@	$5.25
Superstandard	4.25	@	4.75
Northern Standard Wrapping	4.00	@	—
Standard Wrapping	3.62½	@	—
Tissues—Per Ream—Carlots			
White No. 1	.87½	@	—
White No. 1 M. G.	.85	@	—
White No. 1½	.62½	@	—
White No. 2	.60	@	—
Anti-Tarnish M. G.	.75	@	—
Colored	.87½	@	—
Kraft	.75	@	—
Manila	.60	@	—
Unbl. Toilet, 1 M.	3.25	@	—
Bleached Toilet	5.26	@	—
Paper Towels, Per Case—			
Unbleached, Jr.	1.80	@	—
Bleached, Jr.	3.10	@	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	7.75	@	9.75
No. 1 Manila Wrapping, 35 lb.	5.00	@	—
No. 2 Manila Wrapping, 35 lb.	4.75	@	—
Boards, per ton—			
News	45.00	@	—
Chip	45.00	@	—
Sgl. Mla. Lt. Chip	57.50	@	—
Jute Lined Chip	57.50	@	—
White Pat. Coated	70.00	@	—
Kraft Liners	45.00	@	47.50
Binders Boards	76.00	@	87.00

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds		Ledgers	
100% Rag Ext. No. 1.	$39.10	@ $46.00	$40.25	@ $47.25
100% Rag	31.05	@ 36.50	32.20	@ 37.75
85% Rag	.....		29.90	@ 35.00
75% Rag	23.60	@ 27.75	24.75	@ 29.00
65% Rag	.....		21.65	@ 26.25
50% Rag	17.55	@ 21.50	18.70	@ 22.75
25% Rag	14.65	@ 17.75	15.80	@ 19.25

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds		Ledgers	
No. 1	$8.60	@ $10.50	$9.75	@ $12.00
No. 2	7.70	@ 9.50	8.90	@ 10.75
No. 3	6.75	@ 8.25	7.90	@ 10.00
No. 4	7.00	@ 8.50	8.20	@ 10.00

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper, Delivered in Zone 1:

No. 1 Glossy Coated	$11.30	@	$12.75
No. 2 Glossy Coated	9.70	@	11.00
No. 3 Glossy Coated	8.60	@	10.00
No. 4 Glossy Coated	8.05	@	9.25
No. 1 Antique (watermarked)	8.05	@	9.25
No. 2 Offset	7.45	@	8.50
A Grade E. F.	7.20	@	8.25
A Grade S. & S. C.	7.45	@	8.50
B Grade E. F.	6.65	@	7.75
B Grade S. & S. C.	6.90	@	8.00
C Grade E. F.	6.40	@	7.50
C Grade S. & S. C.	6.65	@	7.75
D Grade E. F.	6.10	@	7.00
D Grade S. & S. C.	6.35	@	7.25

Ivory & India at $.50 cwt. extra.

Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—			
Moist	30.00	@	35.00
Dry	30.00	@	35.00
(Delivered)			
No. 1 Domestic and Canadian	38.00	@	40.00

Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—			
Prime Bleached Sulphite	2.50	@	3.00
Prime Qualities—			
Easy-Bleaching Sulphite	2.20	@	2.35
Strong Unbleached Sulphite	2.10	@	2.30
(On Dock, Atlantic Ports)			
Kraft Bleached	2.50	@	3.25
Kraft Light & Strong	1.65	@	1.80
Kraft No. 1	1.60	@	1.75
(F. o. b. Pulp Mill)			
Kraft Domestic	1.60	@	2.00
(Delivered)			
Soda Bleached	2.55	@	—

Add 60 cents per short ton, dock charges for Albany; $2.50 for Lake Ports East and $3.50 for Lake Ports West of Mackinac Straits. Also add extra freight charges and war insurance to all quotations on imported pulp.

Domestic Rags

New Rags

All prices nominal.

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	8.00	@	8.25
Silesias No. 1	4.50	@	4.75
New Unbleached	8.00	@	8.25
Blue Overall	4.90	@	5.00
Fancy	1.75	@	2.00
Washables	1.50	@	1.60
Mixed Khaki Cuttings	2.25	@	2.50
O. D. Khaki Cuttings	3.25	@	3.40

Old Rags

White, No. 1—			
Repacked	2.90	@	3.13
Miscellaneous	2.10	@	2.25
White, No. 2—			
Repacked	1.50	@	1.60
Miscellaneous	1.25	@	1.40
Thirds and Blues—			
Repacked	1.30	@	1.40
Miscellaneous	1.15	@	1.30
Roofing Rags—			
No. 1	1.75	@	2.00
No. 2	1.30	@	1.40
No. 3 (bagging)	1.50	@	1.60
No. 4	.60	@	.65
No. 5A	.60	@	.65

Foreign Rags

All prices nominal

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	@	2.20
New Light Silesias	5.50	@	5.75
Light Flannelettes	5.50	@	5.75
New White Cuttings	7.00	@	7.50
New Light Oxford	4.00	@	4.50
New Light Prints	3.00	@	3.25

Old Rags

No. 1 White Linens	7.50	@	8.50
No. 2 White Linens	6.50	@	7.50
No. 3 White Linens	4.50	@	—

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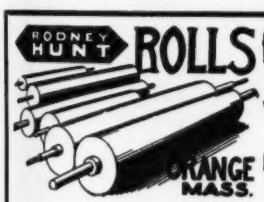

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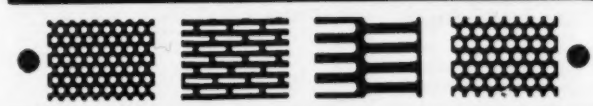

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No. 4 White Linens.	2.25	@	3.25
No. 1 White Cotton.	4.25	@	4.75
No. 2 White Cotton.	3.25	@	3.75
No. 3 White Cotton.	2.50	@	3.00
No. 4 White Cotton.	1.90	@	2.20
Extra Light Prints..	2.00	@	2.40
Ord. Light Prints...	1.75	@	2.15
Med. Light Prints...	1.55	@	1.95
Dutch Blue Cottons.	2.25	@	2.50
French Blue Linens..	3.00	@	—
Checks and Blues...	2.00	@	—
Linsey Garments.....	1.90	@	2.00
Dark Cottons.....	1.50	@	1.60
Old Shopperies.....	1.30	@	1.45
New Shopperies.....	1.45	@	1.50
French Blues.....	2.25	@	2.50

Old Rope and Bagging

All prices nominal

(Prices to Mill, f. o. b. N. Y.)

Gunny No. 1—			
Foreign	2.25	@	2.50
Domestic	1.75	@	2.00
Wool Tares, light...	1.75	@	2.00
Wool Tares, heavy..	1.80	@	1.90
Bright Bagging.....	1.75	@	1.90
Manila Rope—			
Foreign	3.50	@	4.00
Domestic	3.00	@	3.50
Jute Threads.....	3.00	@	3.25
Sisal Strings	1.50	@	1.60
Mixed Strings....	.55	@	.60

Old Waste Papers

(F. o. b. New York)

Shavings—			
White Envelope Cuttings	2.75	@	3.00
Ordinary Hard White No. 1....	2.25	@	2.50
Soft White No. 1..	1.70	@	1.80
Soft White Extra..	2.25	@	2.40
Flat Stock—			
Stitchless	.80	@	.85
Overissue Mag.....	1.15	@	1.25
Solid Flat Book...	1.00	@	1.10
Crumbled No. 1...	.40	@	.45
Ledger Stock White.	1.55	@	1.65
Ledger Stock Colored	1.05	@	1.15
Manila—			
New Env. Cut....	1.60	@	1.75
New Cuttings.....	1.25	@	1.35
Old Kraft Machine—			
Compressed bales..	1.05	@	1.15
News—			
No. 1 White News	1.75	@	1.90
Strictly Overissue..	.60	@	.65
Strictly Folded....	.55	@	.60
Corrugated	.65	@	.75
No. 1 Mixed Paper..	.55	@	.60

Twines

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.18	@	—
White Hemp.....	.18	@	—
Fine Polished—			
Fine India.....	.23	@	—
Unpolished—			
Box	.14¼	@	—
Paper Makers.....	.14½	@	—
Tube Rope.....	.15	@	—
Wall Paper.....	.14¾	@	—
Wrapping	.17	@	—
Soft Fiber Rope...	.16¼	@	—
Cotton	.21	@	—

(Hard Fiber)

Medium Java.....	.18	@	—
Mex. Sisal.....	.14	@	—
Manila	.24	@	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill, f. o. b. Phil.)

Shirt Cuttings—			
New White No. 1.	.07¼	@	.07½
New White, No. 2.	.04	@	.04½
Light Silesias.....	—	@	.04½
Silesias, No. 1.....	—	@	.04½
Black Silesias, soft	—	@	.03¾
New Unbleached..	.05½	@	.06
Washable, No. 1..	—	@	.04
Blue Overall.....	—	@	.05
Cottons—According to grades—			
Washable No. 2...	—	@	.02
New Blue.....	—	@	.02
Fancy Percales....	—	@	.03
New Black Soft...	—	@	.04
New Light Seconds	.04½	@	.05
New Dark Seconds	—	@	1.50
Khaki Cuttings—			
No. 1 O. D.....	.03½	@	.04
No. 2 Mixed.....	.03	@	.03¼
Corduroy	—	@	.02½
New Canvas.....	.05½	@	.06
New Black Mixed.	—	@	03

Domestic Rags (Old)

White No. 1—			
Repacked	3.50	@	4.00
Miscellaneous	2.75	@	3.00
Thirds and Blues—			
Miscellaneous	2.00	@	2.25
Repacked	2.50	@	2.75
Black Stockings (Export)	3.50	@	4.00
Roofing Stock—			
Foreign No. 1.....Nominal			
Domestic No. 1...	1.50	@	1.60
Domestic No. 2...	1.35	@	1.45
Roofing Bagging..	—	@	1.30

Bagging

(F. o. b. Phila.)

Gunny, No. 1—			
Foreign .....Nominal			
Domestic	2.50	@	3.00
Manila Rope.....	—	@	4.50
Sisal Rope.....	1.75	@	2.00
Mixed Rope.....	1.25	@	1.50
Scrap—			
No. 1.....	2.25	@	2.50
No. 2.....	—	@	1.40
Wool Tares, heavy..	3.50	@	3.70
Mixed Strings.....	.75	@	1.00
No. 1 New Light Burlap	3.00	@	3.50
New Burlap Cuttings	2.00	@	2.25

Old Papers

(F. o. b. Phila.)

Shavings—			
No. 1 Hard White	2.25	@	2.30
No. 2 Hard White	2.00	@	2.10
No. 1 Soft White.	1.75	@	1.80
No. 2 Soft White.	1.40	@	1.50
No. 1 Mixed.....	.90	@	1.00
Solid Ledger Stock..	1.50	@	1.60
Ledger Stock, white.	1.30	@	1.35
Ledger Stock, colored	1.00	@	1.10
No. 1 Books, heavy..	.80	@	.90
Manila Cuttings.....	1.90	@	2.00
Print Manila.....	.70	@	.75
Container Manila....	.65	@	.70
Kraft Paper.....	1.00	@	1.10
No. 1 Mixed Paper..	—	@	.55
Straw Board Chip...	—	@	.50
Binders Board Chip..	—	@	.50
Corrugated Board...	.62½	@	.67½
Overissue News.....	.70	@	.75
Old Newspapers.....	.65	@	.70

BOSTON

Old Papers

(F. o. b. Boston)

Shavings—			
No. 1 Hard White	2.25	@	2.50
No. 1 Soft White.	1.85	@	2.15
No. 2 Mixed.....	.75	@	.80
Solid Ledger Books..	1.30	@	—
Overissue Ledger Stock	1.30	@	1.50
Mixed Ledgers.....	.85	@	.90
No. 1 Books, heavy..	.70	@	—
No. 1 Books, light..	.65	@	.75
Crumpled Stitchless Book Stock.....	.55	@	.65
Manila Env. Cuttings	1.70	@	.85
Manila Envelope Cuttings, Extra Quality	2.20	@	2.25
No. 1 Old Manila...	.80	@	.90
White Blank News..	1.30	@	1.40
No. 1 Kraft.....	1.20	@	1.30
Mixed Papers.....	.52½	@	.55
Print Manila	.70	@	.75
Container Manila....	.60	@	.70
Old Newspapers.....	.60	@	.65
Paper Wool Strings..	.65	@	.75
Overissue News.....	.70	@	.75
Box Board Chips....	.52½	@	.55
Corrugated Boxes....	.75	@	.80
Kraft corrugated boxes	1.00	@	1.05
Screening Wrappers.	.60	@	.70

Bagging

(F. o. b. Boston)

Manila Rope—			
Foreign	4.00	@	—
Domestic	4.00	@	4.50
Sisal Rope.....	2.00	@	2.25
Mixed Rope.....	.75	@	.80
Transmission Rope..	2.50	@	3.00
Soft Jute Rope.....	2.25	@	2.50
Jute Carpet Threads.	1.25	@	1.50
Gunny Bagging—			
Foreign	2.10	@	2.25
Domestic	2.10	@	2.25
Bleachery Burlap....	3.00	@	3.50
Scrap Burlap—			
Foreign .....(nominal)			
Domestic	1.62½	@	1.75
Scrap Sisal.....	1.90	@	2.00
Scrap Sisal for Shredding	2.25	@	2.50
Wool Tares, Heavy..	1.40	@	1.50
New Burlap Cuttings	2.75	@	3.00
Aust. Wool Pouches.	2.50	@	3.00
Heavy Baling Bagging	2.00	@	2.25
Paper Mill Bagging..	1.25	@	1.50
No. 2 Bagging.....	1.25	@	1.30

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints...	.03¼	@	.03½
New White No. 1....	.07	@	.07¼
New Light Flannelettes	.05	@	—
Silesias No. 1.....	.04	@	.04¼
New Black Silesias..	.03½	@	.03¾
Soft Unbleached.....	7.50	@	8.00
Blue Cheviots.....	.05½	@	.06
Fancy	.02	@	.02½
Washable	.02	@	.02½
Cottons—According to grades—			
Blue Overalls.....	.05¼	@	.05½
New Black, soft...	.03¾	@	.04
Khaki Cuttings.....	.02½	@	.03
O. D. Khaki.....	.03	@	.03¼
Corduroy	.02¾	@	.03
New Canvas.....	.06¾	@	.07¼
B. V. D. Cuttings...	.07	@	.07½

Domestic Rags (Old)

(F. o. b. Boston)

Canvas	.04¼	@	—
White No. 1—			
Repacked	—	@	2.71
Miscellaneous	2.50	@	2.75
White No. 2—			
Repacked	1.90	@	2.00
Miscellaneous	2.00	@	2.25
Twos and Blues.....	2.25	@	2.50
Old Blue Overalls...	1.60	@	2.00
Thirds and Blues—			
Repacked	2.00	@	2.25
Miscellaneous	1.50	@	1.60
Black Stockings.....	4.00	@	4.25
Roofing Stock—			
No. 1.....	1.75	@	2.00
No. 2.....	1.60	@	1.65
No. 3.....	1.00	@	1.25

Foreign Rags

(F. o. b. Boston)

Dark Cottons.....(nominal)	
Dutch Blues.....(nominal)	
New Checks and Blues(nominal)	
Old Fustians.....(nominal)	
Old Linsey Garments.(nominal)	
New Silesias.....(nominal)	

CHICAGO

Old Papers

(F. o. b. Chicago)

Shavings—			
No. 1 White Envelope Cuttings....	1.80	@	1.90
No. 1 Hard White.	1.70	@	1.80
No. 1 Soft White..	1.50	@	—
Ledger & Writings..	.75	@	.80
Solid Books.....	.45	@	.50
Blanks	.90	@	—
Krafts	.45	@	.50
New Kraft Cuts.....	1.10	@	—
Manila Env. Cuts...	Nominal		
Ex. No. 1 Manila...	Nominal		
Print Manila	Nominal		
Overissue News.....	.35	@	—
Old Newspapers—			
No. 1 Folded News	.25	@	.30
No. 1 Mixed Paper	.15	@	.20
Roofing Stocks—			
No. 1.....	1.00	@	1.05
No. 2.....	.85	@	—

TORONTO

Paper

Bonds

Direct mill shipment in two-ton lots

No. 1 White $35.50		@	—
No. 1 Tints	36.50	@	—
No. 2 White	25.50	@	—
No. 2 Tints	26.50	@	—
No. 2 Golden Rod..	27.50	@	—
No. 3 White	21.00	@	—
No. 4 White	15.00	@	—
No. 4 Tints	16.00	@	—
No. 4 Golden Rod...	17.00	@	—
Direct mill shipment in three-ton lots			
No. 5 White $10.50		@	—
No. 5 Tints	11.50	@	—
No. 5 Golden Rod..	12.00	@	—
No. 6 White	9.00	@	—
No. 6 Tints	9.50	@	—
No. 6 Golden Rod..	11.00	@	—
No. 7 White	8.00	@	—
No. 7 Tints	8.50	@	—
No. 7 Golden Rod..	10.00	@	—
Book—			
No. 1 M. F.	$7.00	@	—
No. 2 M. F.	6.50	@	—
No. 3 M. F.	5.35	@	—
No. 1 S. C.	7.25	@	—
No. 2 S. C.	6.75	@	—
No. 3 S. C.	5.85	@	—

Coated Book & Litho

Ton Lots (resale)

No. 1 .....$12.00		@	—
No. 2	10.25	@	—
No. 3	8.90	@	—
Coated tinted	13.00	@	—
Wrapping—delivered—			
Rag Brown.....	4.85	@	5.25
White Wrap.....	4.00	@	—
"B" Manila.....	4.90	@	6.15
No. 1 Manila.....	5.50	@	6.90
Fiber	5.50	@	6.90
Kraft No. 2.....	5.50	@	6.90

(F. o. b. Cars, Toronto)

News per ton—			
Rolls (contract)..)46.00		@	—
Sheets 54.00		@	—

Pulp

Ground wood.....$32.00		@	36.00
Unbleached sulphite.	44.00	@	—
Bleached sulphite...	54.00	@	—
Kraft	50.00	@	—
Soda	54.00	@	—

Old Waste Paper

(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut...	2.00	@	—
Soft White..	1.75	@	—
White Blk. News..	1.25	@	1.10
Book and Ledger—			
Flat Magazine and Book Stock (old)	.70	@	—
Light and Crumpled Book Stock.	.60	@	—
Ledgers and Writings	1.00	@	—
Manilas—			
New Manila Cut...	1.35	@	—
Printed Manilas...	.45	@	—
Kraft	.95	@	—
News and Scrap—			
Strictly Overissue..	.50	@	—
Strictly Folded....	.45	@	—
No. 1 Mixed Paper..	.30	@	—

Domestic Rags

(Price to Mills, f.o.b. Toronto)

No. 1 White Shirt Cuttings	.07	@	.07¼
Light Prints.....	.03¼	@	.03½